THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

OCTOBER, 1889.

THE STERILIZATION OF FECES.[1]

By Charles J. Foote, M.D.,
of New Haven, Conn.

The purpose of the experiments stated in this paper is: first, to determine whether corrosive sublimate is a good disinfectant for feces, and if it is not, whether this is due to the formation of inert, insoluble compounds of mercury with the feces; second, to determine the relative value of certain other disinfectants used for this purpose.

The only sure method to determine the value of corrosive sublimate for disinfecting feces is to mix it with feces, and after a certain number of hours inoculate some culture medium from the mixture, and thus determine whether it is sterile or not.

Method.—Standard solutions of the disinfectants to be tested were made up according to the following formulæ:

℞.—Corros. subl.	ʒij.
Water.	C. i.
℞.—Chloride of lime[2]	ʒiv.
Water	C. i.
℞.—Sulphate of iron	ʒxviij.
Water	C. i.

[1] The experiments included in this paper were performed in the laboratories of the Yale Medical School.

[2] This was up to the pharmacopœial strength, but not up to the commercial.

℞.—Corros. subl. . . . . ʒij.
Tartaric acid . . . . . ʒx.
Water . . . . . C. i.

℞.—Hydrochloric acid . . . . . 1 per cent. (ʒx to C. i.)

℞.—Corros. subl. . . . . ʒij.
Hydrochloric acid . . . . . ʒx.
Water . . . . . C. i.

℞.—Carbolic acid . . . . . 5 per cent. (ʒl to C. i.)

℞.—Corros. subl. . . . . ʒij.
Potass. permang. . . . . ʒij.
Water . . . . . C. i.

As a test mixture, normal feces were used mixed with about two-thirds their bulk of decomposing urine. The feces were thoroughly mixed with the urine, and the mixture had about the consistency of pea-soup. A fresh fecal mixture was made for each experiment and, although the mixtures were of nearly uniform consistency, there was undoubtedly some variation in the amount of solid matter present in each, consequently it is not entirely safe to compare the effects of a disinfectant in one experiment with those of another one in a different experiment. Five hundred cubic centimetres of this mixture were regarded as a dejection in the first five experiments; in the sixth experiment two hundred cubic centimetres were used.

A normal daily evacuation of the bowels amounts, according to Vallin, to 150 to 200 grammes (5 to 6½ ounces); according to Dr. Edward Smith, to 8.55 ounces. In pathological conditions, however, such as cholera or typhoid fever after an intestinal hemorrhage, the amount of a dejection often approaches a pint or more, and in addition to this a few hundred cubic centimetres of urine are usually passed with the dejection; consequently a pint of fecal matter with urine would not be an unusually large amount to disinfect for one dejection. Since large amounts of fecal matter are hard to handle, with requisite neatness, in a bacteriological laboratory, I have used one-half the amount of the disinfectant usually recommended, with one-half the amount of a dejection.

Two hundred and fifty cubic centimetres of this mixture, therefore, were added to five hundred cubic centimetres of the disinfectant in a glass battery-jar and the whole thoroughly mixed up with a glass rod. This mixture was then poured through a glass funnel into a sterilized glass flask, which, after the careful withdrawal of the funnel so as not to touch the sides of the flask, was plugged with sterilized cotton. At the end of one hour, four hours, and forty-eight hours, inoculations were made from this mixture into tubes of sterile beef bouillon and into tubes of nutrient gelatine. The inoculations were made by a loop of sterilized

platinum-wire, which was plunged down to the bottom of the flask during the momentary withdrawal of the cotton plug, and which was thence quickly inoculated into tubes of beef bouillon. The same procedure was repeated in inoculating the gelatine tubes.

The tubes of beef bouillon inoculated were then placed in an incubator at the temperature of 40° C. (104° F.), and watch kept for the first signs of cloudiness, which indicates the presence of bacteria.

The gelatine tubes which were inoculated were immediately made into plates, which were kept for eight days at the temperature of the laboratory (70° F.). The colonies which had then developed were counted. In some cases it was necessary to count the number before this on account of the liquefaction of the gelatine.

The experiments consisted of six series. Each one of the series was performed at a different time, and in each one both nutrient gelatine and beef bouillon were used as culture fluids. In the first series the gelatine plates were duplicated; both tubes and plates were duplicated in the third series.

Two different culture media were used, that each might be a check on the other. Nutrient gelatine has a wider range as a nutrient medium than beef bouillon, and, therefore, the experiments with this are of more value. Certain bacteria will grow in gelatine that will not grow in beef bouillon, as, for example, staphylococcus pyogenes aureus. I have also isolated pure cultures of two species of bacteria, taken from the colonies of gelatine plates of Experiment V. of chloride of lime, which will not grow in beef bouillon. This explains partly why the results with gelatine plates frequently differ from the results with beef bouillon.

On the other hand, I have not found any bacteria in beef bouillon that will not grow in gelatine. It will be observed that in Experiment VI. the gelatine plates inoculated from the carbolic acid mixture, after one hour and forty-eight hours, were sterile, while the corresponding beef bouillon tubes broke down. I therefore inoculated gelatine tubes from the bouillon cultures, and found that the bacteria thus inoculated grew luxuriantly in gelatine. How to explain this discrepancy I do not know, unless it may be said that the spores of certain bacteria will not develop in gelatine, while the bacteria themselves grow well in this.

The gelatine plates give us a rough quantitative estimation of the effects of the disinfectant used. They further show us that the colonies often develop from minute lumps of fecal matter, easily seen in the gelatine, showing that even a very small amount of fecal matter around a bacterium is often sufficient to protect it from powerful disinfectants. It may be well to state that the mixture of feces with chloride of lime forms an adhesive froth containing much solid matter; and, consequently, a greater mass adheres to the inoculating needle and is inoculated into the culture medium than in the case of the mixtures with

other disinfectants; consequently, comparing the number of colonies of the plates inoculated from this germicide, with those from others, places chloride of lime at a disadvantage.

After inoculations had been made from the mixtures of feces and disinfectants, at the end of forty-eight hours, the mixtures containing the bichloride were filtered and the filtrates tested quantitatively for mercury. The process of filtering exposed the mixture freely to the air of the laboratory for twenty-four hours or longer. After filtration the filtrates were tested to see whether they were sterile by inoculating a drop of each filtrate into a tube of sterile bouillon. The tubes were then placed in an incubator and watch kept for cloudiness.

The filtrates were also tested to see whether they possessed any germicidal properties. To do this, equal parts of a filtrate and of a beef bouillon culture of the bacillus typhosus were mixed with each other, and after standing the time stated below in the table, inoculations were made into tubes of bouillon.

Only the first, fifth, and sixth experiments with the chloride of lime are valuable, the others are only remarkable to emphasize the fact that solutions of the chloride of lime rapidly deteriorate by keeping, even when in tightly corked bottles. In comparing the power of the chloride of lime with that of the other disinfectants, only those experiments should be compared where a fresh solution of chloride of lime was used.

These experiments furnished an excellent opportunity to observe the deodorant effects of the disinfectants tested. Sulphate of iron, which is often regarded as a good deodorant, developed an odor considerably more disagreeable than that of the mixture of feces with sterilized water. The odor did not seem to be lessened in any appreciable degree after seventy-two hours when the flask was emptied. The bichloride and the mixtures of the bichloride with hydrochloric acid, tartaric acid, and potassium permanganate are primarily good deodorants. Thus at the end of four hours there was no appreciable odor from mixtures containing these. After forty-eight hours, however, a very sickening odor was developed in all these mixtures. This was not of putrefactive origin, since the mixtures were frequently perfectly sterile. Chloride of lime rapidly destroyed all fecal odor, but replaced it by its own. Carbolic acid also destroyed all fecal odor after four hours.

I am indebted to Dr. H. E. Smith, Professor of Chemistry in the Yale Medical School, for the following statement of the method adopted for determining the amount of mercury in the filtrates; for all the chemical analyses I am greatly indebted to Mr. W. P. Baldwin, of the Yale Medical School.

"*The Solution of Mercuric Chloride.*—To make the 1 : 500 solution of bichloride, fourteen grammes of the dry salt were dissolved in seven litres of distilled water. That the solution was of the desired strength,

and that it did not become weaker by precipitation during the period of experimenting with it, is shown by the following analytical results: 200 c.c. were acidulated and the mercury precipitated as sulphide, which was collected and weighed on filter-papers.

"I. The fresh solution, before the experiments:

HgS obtained.	Calculated as $HgCl_2$.	Required.
(1) 0.3433 grm.	0.4010 grm.	0.4 grm.
(2) 0.3425 "	0.4001 "	

"II. After the experiments, when the solution was three and a half months old:

HgS obtained.	Calculated as $HgCl_2$.	Required.
(1) 0.3441 grm.	0.4019 grm.	0.4 grm.
(2) 0.3424 "	0.4000 "	

"*The Method of Chemical Analysis.*—It was our intention to ascertain how much of the mercury was precipitated in the fecal mixture, by separating the fluid portion by filtration, washing the solid residue with water, and determining the mercury remaining in the filtrate and wash water; but it was found to be impracticable to do this, on account of the difficulties of filtration. Therefore, the mixture was in each case put on dry filter-papers, and these changed from time to time until the chief part of the liquid portion had been separated as a clear filtrate. This filtrate was thoroughly mixed and the mercury determined in a portion of it. The results show the mercurial strength of the fluid portion of the mixture after precipitation had been effected.

"The mercury was determined according to the principle of Ludwig.[1]

"The procedure was as follows: From 100 to 200 c.c. of the filtrate was acidulated with from 5 to 10 c.c. of concentrated HCl, and heated gently in a covered beaker with 0.5 to 0.75 gramme of $KClO_3$ until of a light yellow color. After filtering, two gramme of brass filings were added, and the mixture thoroughly stirred from time to time for about half an hour. The amalgam was then collected on asbestos by filtering through a Gooch's crucible, and washed with water, alcohol, and ether; when dry it was transferred with the asbestos filter to a combustion tube closed at one end. The crucible was thoroughly cleaned with more brass filings and asbestos, which were added to the contents of the tube. A layer of dry CuO was then added with a plug of asbestos, and the open end of the tube drawn out to a capillary tube. The CuO was found to be necessary to oxidize the flocculent organic matter which separated during the treatment with the brass. The tube was heated for about half an hour at a dull red heat, and then aspirated very slowly for a few minutes.

[1] Wien. med. Jahrb., 1887, S. 143, and Zeitschr. f. Physiol. Chem., vi. S. 495.

"The mercury was then collected in the capillary tube, which was cut off, dried in the desiccator, and weighed. The mercury was volatilized by heating strongly, and the tube again weighed; the loss gave the weight of metallic mercury obtained.

"To ascertain how completely the mercury was recovered, the following sets of experiments were tried. In the first, 25 c.c. of the $HgCl_2$ solution were diluted with water and treated as above, omitting the use of $KClO_3$. In the second, 25 c.c. of the $HgCl_2$ solution were added to a fluid obtained by treating feces with HCl and $KClO_3$, and still containing free chlorine.

	Mercury obtained.		
	I.	II.	Calculated.
(1)	0.0358 grm.	0.0354 grm.	0.0389 grm.
(2)	0.0332 "	0.0311 "	

"This method may probably be made to yield better results, but these show the error which may be expected to exist in the results given, and these are, therefore, satisfactory for the purpose in hand, especially as the error is probably proportionately less, with smaller quantities of mercury."

Below is a tabulation of the experiments.

EXPERIMENT I.

	1 hour.	4 hours.	Remarks.
Gelatine plates:			
Bichloride, 1 to 500 . . . . *a*	5 colonies.	Sterile.	
b	3 colonies.	354 colonies.	
Chloride of lime . . . . *a*	Sterile.	Sterile.	
b	Sterile.	Sterile.	Fresh solution.
Beef bouillon:			
Bichloride	Cloudy.	.....	
Chloride of lime	Sterile.	.....	Fresh solution.

Filtrate of bichloride mixture with feces tested to see whether it is sterile, by adding one drop to each tube of sterile bouillon:

Tubes of bouillon *a*, sterile.
b, sterile.
c, sterile.

Filtrate tested to see whether it is a germicide by mixing it with an equal part of pure culture of bacillus typhosus, and inoculating tubes of sterile bouillon after an exposure of one-half an hour and of two hours:

Tubes of sterile bouillon inoculated after ½ hour { *a*, cloudy. *b*, cloudy. *c*, cloudy.

" " " " " 2 hours { *a*, cloudy. *b*, cloudy. *c*, cloudy.

Filtrate tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate . . 0.00277

EXPERIMENT II.

	1 hour.	4 hours.	48 hours.	Remarks.
Gelatine plates:				
Bichloride	97 colonies.	13 colonies.	Sterile.	
Chloride of lime	4 colonies.	Sterile.	1 colony.	Solution 2 weeks old.
Sterilized water	Innumerable.	Innumerable.	Innumerable.	
Sulphate of iron	Innumerable.	Innumerable.	Innumerable.	
Bichloride & tart. acid	16 colonies.	Sterile.	Sterile.	
Beef bouillon;				
Bichloride	Cloudy.	Cloudy.	Sterile.	
Chloride of lime	Sterile.	Sterile.	Sterile.	Solution 2 weeks old.
Sterilized water	Cloudy.	Cloudy.	Cloudy.	
Sulphate of iron	Cloudy.	Cloudy.	Cloudy.	
Bichloride & tart. acid	Cloudy.	Sterile.	Sterile.	

Filtrate from bichloride mixture tested to see whether it is sterile, as in Experiment I. Filtrate of bichloride with tartaric acid tested in the same way:

Bouillon tubes inoculated with bichloride filtrate . . . { *a*, sterile. *b*, sterile.

" " " " bichl. and tart. acid filtrate { *a*, sterile. *b*, sterile.

Filtrates, from both the bichloride mixture and from the bichloride with tartaric acid mixture, tested to see whether they are germicides, as in Experiment I.:

Bouillon tube inoculated from bichloride filtrate after 6 hours, sterile.
" " " " bichl. and tart. acid " " " "

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of bichloride filtrate . . 0.00625
" " " " of bichlor. and tart. acid filtrate 0.03135

EXPERIMENT III.

		1 hour.	4 hours.	48 hours.	Remarks.
Gelatine plates:					
Bichloride	*a*	47 colonies.	62 colonies.	Sterile.	
	b	124 colonies.	48 colonies.	2 colonies.	
Bichlor. & hydrochl. acid	*a*	Sterile.	2 colonies.	Sterile.	
	b	1 colony.	Sterile.	1 colony.	
Bichloride & tart. acid	*a*	26 colonies.	24 colonies.	1 colony.	
	b	13 colonies.	10 colonies.	Sterile.	
Hydrochloric acid	*a*	80 colonies.	39 colonies.	Sterile.	
	b	80 colonies.	16 colonies.	Sterile.	
Chloride of lime	*a*	Innumerable.	4 colonies.	1 colony.	Solution 3 weeks old.
	b	5 colonies.	2 colonies.	1 colony.	
Beef bouillon:					
Bichloride	*a*	Cloudy.	Sterile	Sterile.	
	b	Sterile.	Sterile.	Sterile.	
Bichlor. & hydrochl. acid	*a*	Sterile	Sterile.	Sterile.	
	b	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid	*a*	Sterile.	Sterile.	Sterile.	
	b	Sterile.	Sterile.	Sterile.	
Hydrochloric acid	*a*	Cloudy.	Cloudy.	Cloudy.	
	b	Cloudy.	Cloudy.	Sterile.	
Chloride of lime	*a*	Sterile.	Cloudy.	Sterile.	Solution 3 weeks old.
	b	Cloudy.	Sterile.	Cloudy.	

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate . . . . . sterile.
Bichloride and tart. acid . . . . . sterile.
Bichloride and hydrochlor. acid . . . . sterile.

Tested to see whether they are germicides, as in Experiment I.:

Tubes inoculated from bichloride filtrate after 6 hours . . sterile.
" " " " and hydrochlor. acid after 6 hours, sterile.
" " " " and tart. acid after 6 hours . sterile.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
of bichloride 0.00263
of bichloride and hydrochlor. acid . . 0.01888
of bichloride and tart. acid 0.0237

EXPERIMENT IV.

	1 hour.	4 hours	48 hours.	Remarks.
Gelatine plates:				
Bichloride	61 colonies.	1 colony.	Sterile.	
Bichloride & hydrochl. acid	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid .	116 colonies.	2 colonies.	7080 colonies.	
Hydrochloric acid . .	Innumerable.	Innumerable.	Sterile.	
Chloride of lime . . .	53 colonies.	57 colonies.	Innumerable.	Solution 5 weeks old.
Beef bouillon:				
Bichloride	Cloudy.	Cloudy.	Cloudy.	
Bichloride & hydrochl. acid	Sterile.	Sterile.	Sterile.	
Bichloride & tart. acid .	Cloudy.	Cloudy.	Sterile.	
Hydrochloric acid . .	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime . . .	Cloudy.	Cloudy.	Cloudy.	Solution 5 weeks old.

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate . . . . . sterile.
Bichloride and tart. acid . . . . . sterile.
Bichloride and hydrochlor. acid . . . . sterile.

Germicidal power of filtrates not tested in this experiment.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
of bichloride 0.00568
of bichloride and tart. acid . . . . 0.005[1]
of bichloride and hydrochlor. acid . . 0.0195

[1] Probably some error in the estimation.

EXPERIMENT V.

	1 hour.	4 hours.	48 hours.	Remarks.
Gelatine plates:				
Bichloride	332 colonies.	13 colonies.	75 colonies.	
Bichloride & hydrochl. acid	2 colonies.	Sterile.	Sterile.	
Bichloride & tart. acid	1 colony.	1 colony.	1 colony.	
Carbolic acid	2 colonies.	2 colonies.	Sterile.	
Chloride of lime	3 colonies.	6 colonies.	1 colony.	Fresh solution.
Beef bouillon:				
Bichloride	Cloudy.	Cloudy.	Cloudy.	
Bichloride & hydrochl. acid	Sterile.	Sterile	Sterile.	
Bichloride & tart. acid	Sterile.	Sterile.	Sterile.	
Carbolic acid	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime	Sterile.	Sterile.	Sterile.	Fresh solution.

Filtrates of bichloride, of bichloride with tartaric acid, and of bichloride with hydrochloric acid, tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate . . . . . sterile.
Bichloride and tart. acid . . . . . sterile.
Bichloride and hydrochlor. acid . . . . sterile.

Germicidal power of filtrates not tested in this experiment.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
of bichloride 0.0027
of bichloride and tart. acid 0.0372
of bichloride and hydrochlor. acid . . . 0.0269

EXPERIMENT VI.

	1 hour.	4 hours.	48 hours	Remarks.
Gelatine plates:				
Bichloride	9 colonies.	1 colony.	1 colony.	500 c. c. of germicide added to 100 c. c. of feces.
Bichloride & hydrochl. acid	1 colony.	Sterile.	Sterile.	
Bichloride & potass. permang.	Sterile.	Sterile.	Sterile.	
Carbolic acid	Sterile.	1 colony.	Sterile.	
Chloride of lime	20 colonies.	Sterile.	Sterile.	Fresh solution.
Beef bouillon:				
Bichloride	Sterile.	Sterile.	Sterile.	500 c. c. of germicide added to 100 c. c. of feces.
Bichloride & hydrochl. acid	Sterile.	Sterile.	Sterile.	
Bichloride & potass. permang.	Sterile.	Sterile.	Sterile.	
Carbolic acid	Cloudy.	Cloudy.	Cloudy.	
Chloride of lime	Cloudy.	Sterile.	Sterile.	Fresh solution.

Filtrates of bichloride, of bichloride with hydrochloric acid, and of bichloride with potass. permang., tested to see whether they are sterile, as in Experiment I.:

Bichloride filtrate . . . . . sterile.
Bichloride and hydrochlor. acid . . . . sterile.
Bichloride and potass. permang. . . . . sterile.

Germicidal power of filtrates tested as in Experiment I.:

Tube inoculated from bichloride filtrate after 6 hours . . . sterile.
" " " " and hydrochlor. acid after 6 hours sterile.
" " " " and potass. permang. after 6 hours sterile.

Filtrates tested quantitatively for mercury:

Mercury in grammes in 100 c. c. of filtrate—
of bichloride 0.0092
of bichloride and hydrochlor. acid . . . 0.0647
of bichloride and potass. permang. . . . 0.0048

Below is a table compiled from the above experiments showing the amount of metallic mercury in grammes in 100 c. c. of the filtrate, the same amount calculated as bichloride, and the amount of the bichloride required in 100 c. c. of the filtrate, if all the bichloride added to the fecal mixture were held in solution.

		Amount of metallic mercury.	Calculated as bichloride.	Amount required if all added were held in solution.
Bichloride	Experiment I.	0.00277	0.00375	0.133
	" II.	0.00625	0.008468	0.133
	" III.	0.00263	0.00356	0.133
	" IV.	0.00568	0.00769	0.133
	" V.	0.0027	0.00365	0.133
	" VI.	0.0092	0.01246	0.166
Bichloride & tart. acid	Experiment II.	0.03135	0.04248	0.133
	" III.	0.0237	0.0321	0.133
	" IV.	0.005	0.0067	0.133
	" V.	0.0372	0.0504	0.133
Bichloride & hydrochlor. acid	Experiment III.	0.01888	0.02558	0.133
	" IV.	0.0195	0.0264	0.133
	" V.	0.0269	0.03644	0.133
	" VI.	0.0647	0.0876	0.166
Bichloride & potassium permang.	Experiment VI.	0.0048	0.0065	0.166

Below is a table, based on the first five experiments, giving the percentage of gelatine plates and tubes of bouillon remaining sterile for each disinfectant tested. In the case of the chloride of lime only Experiments I. and V. are taken into the average.

	1 hour.	4 hours.	48 hours.
Bichloride	8 per cent.	25 per cent.	60 per cent.
Chloride of lime	80 "	75 "	50 "
Bichloride & tart. acid	30 "	50 "	70 "
Bichloride & hydrochlor. acid	75 "	87 "	87 "
Hydrochlor. acid	0 "	0 "	66 "
Carbolic acid	0 "	0 "	50 "

This table shows that none of these disinfectants are entirely reliable in the proportions used. It does, however, show their relative value well.

The bichloride with hydrochloric acid is by far the most efficient disinfectant. Next in order stands chloride of lime, which acts less efficiently but more rapidly than the bichloride with hydrochloric acid.

The addition of tartaric acid to the bichloride solution somewhat increases its power, though not nearly so much as hydrochloric acid.

The sulphate of iron in Experiment II. shows itself totally inefficient, both as a disinfectant and deodorizer, and there is no rational basis for its use for these purposes. One per cent. solutions of hydrochloric acid, and five per cent. solutions of carbolic acid, have little power as disinfectants.

Experiment VI. has not been included in the above deductions, since the proportion of feces to disinfectant differed from that of the first five experiments. It confirms our conclusions as to the value of the bichloride with hydrochloric acid and of the chloride of lime. It shows that the addition of potassium permanganate to the bichloride solution considerably increases its efficacy. Carbolic acid makes a fairly good showing in Experiment VI. with gelatine, but a very poor one with beef bouillon, consequently it is unreliable. The simple bichloride solution has also shown itself unreliable.

The chemical analyses of the filtrates has shown that considerable mercury exists in solution in them, and the bacteriological tests in Experiments II., III., and VI. have shown that this soluble form of mercury is a powerful germicide—even when diluted one-half, capable of destroying the bacillus typhosus after an exposure of six hours; consequently the inefficacy of the bichloride as a disinfectant does not seem to be due to the fact that it forms insoluble, inert compounds with organic matter, for the compounds are neither insoluble nor inert, but rather due to the lack of power of penetrating organic matter. This being the case, it is doubtful if an increase, within certain limits, in the proportion of the bichloride to feces, would increase its efficacy much.

Experiment VI. further shows that one pint of the best disinfectants (bichloride with hydrochloric acid, bichloride with potassium permanganate, and chloride of lime) is sufficient to sterilize a semi-solid dejection consisting of 100 c.c., after four hours' exposure, but that it is insufficient to sterilize, after four hours' exposure, one of 250 c.c. in a small proportion of cases. Therefore one pint of these disinfectants should be used to every 100 c.c. of a semi-solid dejection.

These experiments were all performed with normal feces. The probability is very slight that these same disinfectants which are efficient in sterilizing normal feces would prove inefficient in cases where pathogenic germs exist, since the spores of the hay bacillus which exist in normal feces are certainly as resistant to the action of germicides as the most resistant pathogenic germs, and far more resistant than the pathogenic

germs most common in feces, such as the bacillus typhosus and the comma bacillus.

CONCLUSIONS.—The best disinfectants to use are the bichloride with hydrochloric acid, the bichloride with potassium permanganate, and the chloride of lime.

Five per cent. solutions of carbolic acid and two-tenths per cent. solutions of the bichloride are unreliable even when used in the proportion of one pint to every 100 c.c. of dejection.

Emphasis needs to be laid on the necessity of thorough disintegration of the fecal matter by stirring with the disinfectant, and on the necessity of allowing the mixture to stand four hours at least before emptying.

For continued use the bichloride solutions would injure lead pipe, while if used for a few days only, probably no injury would result. For long-continued use, where the dejections are thrown into a water-closet, chloride of lime is undoubtedly the most available disinfectant.

Solutions of chloride of lime should be kept tightly corked and should not be used after they are one week old.

ON VARICOSE VEINS OF THE BROAD LIGAMENTS.

BY EDWARD MALINS, M.D.,
OBSTETRIC PHYSICIAN TO THE GENERAL HOSPITAL, BIRMINGHAM.

WHEN we consider the composition of the female pelvis, and study it more particularly with regard to its adaptation to the erect position, we cannot fail to be struck with many problems of interest which it presents, nor can we express surprise that circumstances should frequently combine to occasion deviations from the type of health.

The nature of the circulation, the demands pertaining to physiological requirements, which disturb this, and the complex relations of influences vital and mechanical, give rise to unknown quantities in the formation of estimates. The very nature of the processes involved tends to make perversions liable and to render solution difficult.

It is to some changes in the circulation of the pelvic contents which I wish to call attention, and to endeavor to show that we often fail to allow due proportion to the amount of suffering which arises from changes in this particular respect. Indeed, I am of opinion that a larger share than is considered usual of the ailments of the sex should be credited to causes which have their foundation in changes of the circulation; and I am confident in the assurance that the practical application of this belief is attended with much success in treatment.

Briefly, I may refer to the relations of these structures and the blood-

supply which pervades them. The broad ligaments consist of two quadrangular folds of peritoneum, reaching from the sides of the uterus to the sides of the pelvis. Between the two layers is a quantity of cellular tissue, more or less thick at places, in which the vessels and nerves lie embedded. There is also an amount of muscular fibres derived from the sides of the uterus, and, in addition, the remains of the Wolffian body, or organ of Rosenmüller.

The relation of the cellular tissue is important: it is slight above, but becomes much thicker and looser at the lower level and sides of the uterus. The vessels permeating it are numerous. The uterine arteries, derived from the hypogastric and ovarian arteries, give off a number of parallel branches, which arise at right angles to the main trunk and anastomose freely with the corresponding branches of the opposite side. The ovarian artery, arising from the aorta, gives off a number of branches to the ovary, and, passing by the side of the uterus to the cervix, inosculates with the uterine branch of the internal iliac. On the sides of the uterus the sinuses communicate with large venous plexuses in the broad ligament; these are continuous below with the vaginal plexus, and above with the subovarian plexus, constituting a mass of veins called the pampiniform plexus. Thus the vaginal, uterine, and ovarian veins communicate freely. The ovarian veins are only fully developed after puberty; they possess but few valves, and are remarkable for their number and their size. They begin, as veins do, by radicles continuous with the capillaries, but they rapidly get larger, become knotty, as if varicose at points,[1] and form by anastomosis a plexus with irregular meshes. From this plexus emerge trunks which run parallel to the arterial division and terminate in the utero-ovarian vein, which empties on the right side into the vena cava, and on the left into the renal vein.

From this account of the circulation in the broad ligaments, it will be seen that they consist chiefly of an intricate network of veins; these veins have very few and inefficient valves, so as to be practically destitute of any influence from them. There is also another peculiarity in some of them which aids in promoting derangement—the presence of muscular trabeculæ and smooth muscular fibres; these, in contracting, prevent the return of blood in the capillaries and small veins, and in some parts, such as the spongy portion of the ovary, give all the characters of an erectile organism.

On reflection, we can readily recognize that the main disturbing elements in the circulation in the pelvis are: (1) sexual relations, (2) the function of menstruation, (3) childbearing. In the first there is considerable tension in the circulatory arrangements; in the second process

[1] Courty: Diseases of the Uterus.

the active hyperæmia, rupture of one or more follicles, and disintegration of the uterine mucous membrane, are often attended by profound disturbance; while in the course of pregnancy and parturition the vessels become greatly enlarged, and their work increased, from the augmented blood-supply necessary for so long a period; this strain often leaves permanent ill-effects.

In organs subject to perpetual variations of blood-supply from inherent or natural causes, with but slender mechanical protection, under the supervision of a delicate and sensitive nerve organization, imperfectly controlled and influenced by emotions and passions, the standard of physiological health cannot be a high or a secure one. So, on deliberate thought, we find it. There is an individuality which tends, more or less, toward a perfect type, which is, I think, seldom or never realized. This differs so as to form a standard in each individual, and it is upon a correct knowledge of this that we may base our observations in any given instance. From this we may form deductions and fairly reason from facts to principles.

Starting, then, from what may be looked upon as the normal state of the circulation in the broad ligaments, it will be found that one of the most frequent changes is a varicose condition of the veins of these parts. It is an aggravation, so to speak, of an existing condition. Just as in our moral nature the existence of a virtue may become a vice, so we often find that extremes meet in physical life, and that a physiological function in a strained degree may drift into a pathological process. Numerous illustrations of this could be adduced; pregnancy, for example, is a natural or physiological function, and yet how often it becomes pathological. Certain disorders, spoken of as functional, by persistence or repetition ultimately come to involve change of structure, and in this way may be recognized the origin and explanation of many diseases. In the pelvis we can often trace the following sequence: The veins, instead of emptying, remain distended and full; the weight of the parts is thereby increased, and they become more bulky and heavy; menstrual irregularities are promoted, and local discomfort and pain are experienced.

From this retardation and arrest of circulation, various reflex disturbances are set up, and the sum total is a combination which eventually brings failure of general health in its train. This state of things may subside or yield to treatment, but neglected, or again and again repeated, becomes disastrous. Successive invasions are accompanied by accessory evil agencies until a morbid right of tenure is established, and permanent signs emphasize the presence of an enlarged descending uterus with all the ills of chronic congestion.

The most common causes of varicose veins in the broad ligaments may be divided into two classes: 1. Local. 2. General.

Among the local causes the most frequent in married women is *subinvolution*. We know that in pregnancy there is much congestion of the local venous system; this is evidenced by the dark violet color of the vagina, and often by the presence of varicose veins in the labia; the vaginal plexus communicating, as we have noticed, with the pampiniform plexus in the broad ligament.

When the uterus is emptied of its contents at full term, it is prone to arrest in the process of involution from various reasons; and it is in this condition, where attempted restitution fails, that the veins around it are apt to become dilated and varicose. The failure of involution is more frequent after abortion than after delivery at full term, because from being an abnormal event it is more likely to be associated with disease. The progressive development of the uterus being cut short, there is a greater difficulty in the assumption of the means toward a normal restitution of its structure. The muscular fibre cells retain their condition of partial development—as it were, reluctant to take on the changes of fatty degeneration, atrophy, and absorption which a more natural end to pregnancy brings. Hence the uterus remains increased in bulk and weight, and the circulation in it and its vicinity is hindered and exposed to further complications.

Subinvolution is the incubus of uterine disorders; it is the centre from which innumerable ailments spring and evolve. It is the most frequent source of uterine disease. Aran was right when he classed two-thirds of all utero-ovarian disease as the results of pregnancy, labor, and abortion, subinvolution being the basis upon which the number is founded.

Displacements of the uterus, from whatever origin, will be likely to cause arrest in the circulation of the broad ligaments and a tendency to the formation of varicose veins. Displacement, indeed, is only a symptom. As in descent it involves some relaxation of the suspensory ligaments of the uterus, we must look to these for the reason. It is usually found that some degree of retroversion precedes it, and to admit of this there must be some weakening of the supporting structures, the broad ligaments, and the utero-sacral ligaments; the want of elasticity and power ultimately involves the structure of the ligaments themselves, and renders the circulation more tardy. Pressure on the rectum leads to constipation and hemorrhoids, while straining, lifting weights, or standing for a length of time, considerably aggravates the condition. I have found that anteversion in an inordinate degree is a frequent occurrence and common cause of arrest of circulation. The uterus, obeying its natural inclination forward, is pressed upon by the abdominal contents above, aided by tight lacing or the fashionable abuse of an abdominal belt. At times it becomes completely subverted; bimanually the fundus can be felt above the pubis, while the os uteri points directly upward toward the sacrum and chafes against the upper part of the posterior

cul-de-sac. The broad ligaments are thus twisted on their lateral axes, and necessarily the blood-flow through them is impeded or blocked by the most effectual of mechanical means.

Constipation, as a habit, favors stagnation in the pelvic circulation, and from this reason must be regarded as a factor in the production of ill-effects arising from its persistence.

In short, anything which alters the position or increases the weight of the uterus, or weakens its supports, invites the presence of enfeebled or varicose veins.

It is of common occurrence to meet with cases where the relation of cause and effect may be traced in their reaction upon each other. What a vicious circle presents itself: the uterus is enlarged from some of the causes I have mentioned; the enlargement gives rise to increased weight; of course, larger size and bulk cause alteration in position; malposition engenders stasis or defective circulation; malnutrition is the result: from these come pressure, erosions, catarrh, pain, and reflex symptoms; the general health becomes affected, and resents the local irritation; malaise, feebleness, neuroses, and loss of power in mind and body follow. Thus the symptoms surely evolve, until the patient finally breaks down and becomes a confirmed invalid of a type unfortunately well known. These chronic conditions are not rare; interpreted by a recognition of these phenomena, they find a true solution only in the correction of the cause which calls them into existence.

The strongest test to apply to any method of clinical reasoning is the test of experience. The application of treatment based upon right theory is, in the truest sense, logical, and the practical outcome must, therefore, be expected to prove the premises correct; experience shows that this is so, and that in adjusting the circulation and remedying the various drawbacks which pervert it, we restore the lost balance, make the return to health possible, and generally certain.

There are, in the second place, some constitutional states of health which are associated with defects in the circulation, and which affect that of the pelvis particularly. Deficient power in the right side of the heart from organic disease or lung complications, liver affections, and disorders of the digestive apparatus, often are accompanied by hemorrhoids and pelvic congestion from obstruction in the portal system. Pressure from abdominal tumors also induces the same effects. Renal troubles constantly give rise to impurity and increased liability to disease, the venous circulation partaking readily of the taint thus imported. The veins lose tone and elasticity, they become more lax and easily dilated, and at times set up local inflammation and thickening in spots or short tracts, which destroy their vitality and tend to constrictions, contortions, or varices.

From what has been said, it will be inferred that the symptoms of

varicose veins in the pelvis are those associated with slackening or arrest of the blood current in the neighborhood of the uterus.

Thus there may be a sense of weight and fulness in the pelvis, sometimes most felt at the sacrum or perineum; dull aching in the back; what are described as dragging pains; local discomfort and uneasiness, with often some interference with micturition, or vesical irritation; generally, too, constipation.

There will probably be found some alteration in the position of the uterus, backward, forward, or some degree of descent. The cervix is generally œdematous, with catarrhal discharge from its interior, and some increase of secretion from the vaginal mucous membrane. All these indications are aggravated by the upright position, by long standing, or by unusual fatigue or exertion. It will be observed that the mucous membrane of the vagina is dark colored; there are often full and enlarged veins in the vaginal roof or in the labia. Bimanually fulness may be detected in the broad ligaments, particularly if careful examination in this manner is made by the rectum, and an appreciable enlargement is often felt. If these conditions exist with hemorrhoids in conjunction with a vascular system enfeebled by constitutional derangements, we may be satisfied that the broad ligaments are suffering, and that their form has become altered and their veins varicose.

"Sometimes in the thickness of the broad ligaments, dilated venous bundles, resembling the pampiniform plexus in man, forming tumors of varying dimensions, attaining half the size of the fist, and reaching the renal region, coinciding with great congestion of the uterine tissue, and very marked in aged women who have succumbed in the midst of symptoms of obstruction of the venous, abdominal, or general circulation."[1]

In one case of this kind, to which my attention was called by Dr. Hogben, the veins in the broad ligaments were quite as thick as the little finger, and formed masses the size of a hen's egg in each.

With this view of the pathological changes resulting from the train of complications I have enumerated, it is no doubt possible to conjecture what the rational treatment should be. It obviously aims at restoring the equilibrium of the circulation and maintaining it in a healthy tone.

Bleeding is one of the most useful practices which has fallen into disuse in modern times. Yet its advantages are undoubted, and have been extolled by those whose testimony is indubitable. In the presence of uterine congestion, and where the veins are full and plentiful, local bloodletting is of the highest service. It is of much benefit, and of the first consideration, to relieve the bloodvessels and to pave the way to subsequent treatment. The application of leeches to the cervix is tedious and troublesome, and though it answers well, the results can be as effectually obtained by puncturing the cervix. Five or six punctures

[1] Courty: Diseases of the Uterus, p. 467.

a quarter of an inch deep can be made, and three or four drachms of blood taken away. The best time to do this is soon after a menstrual period, again in about ten days, and also before the menstrual return. After the bleeding a tampon of cotton soaked in glycerine packed around the cervix gives relief to the vessels and comfort to the local symptoms. The number of times this may require to be repeated depends upon the amount of congestion and the effect produced.

Combined with this method much assistance in reducing congestion will be gained by the daily use of irrigation with hot water, two or three pints at a temperature of 100° or 110° Fahrenheit allowed to pour slowly against the cervix and vaginal roof.

The next step is the application of a well-adjusted Hodge's pessary. Perhaps no appliance is capable of doing more good in certain cases than a properly applied pessary, and I have constantly seen patients whose existence with regard to the duties of daily routine has been almost intolerable, enter a new phase of life by the right use of this simple instrument. Rightly used, it lifts up the uterus, it restores its position, it takes off the superincumbent weight of intestines, it keeps the vaginal walls in some measure apart, and thus allays irritability and inflammation, and, above all, it allows the circulation to be properly conducted. But, to be useful, it must be made to fit the patient. It is a common practice to apply pessaries on the plan of Procrustes' bed—to make the patient fix the pessary. There could not be a greater error, or a more fertile source of harm. At times a little ingenuity is required, but well done it is eminently worth the trouble and procures a marked effect.

The application of a pessary is like many devices in the ordinary run of mechanical treatment, which exemplify the fact that it is the abuse and not the use which brings discredit on the mode of treatment. To stuff a pessary into the vagina forgetful of the method of action upon which it should be applied, regardless of all consideration of form, size, shape, or material of object, or containing space, is hardly likely to do good. So much recklessness has been observed in this respect that it has called forth just condemnation, and the comment that at times it requires more skill to remove a pessary than to introduce one! All instrumental appliances require care and watching for a time until their due effect is produced; much more is this the case in dealing with delicate structures where there is likely to be resentment from rough usage or ill-judged calculations of adaptation.

We must be mindful also of the general health. Constipation is the chief trouble of local importance; due attention to rest, exercise, and dietetic regulations must not be omitted.

There are occasionally met with, instances which resist all methods of treatment however judiciously planned or arranged. Some ulterior

measures which have for their object a radical cure may be adopted. Months or even years may fail to bring the patient to the required standard of health for the active purposes of life; the best-directed efforts may not have been successful in displacing the chronic invalidism which is associated with enlarged and varicose veins in this direction. Presuming that we have exhausted all ordinary resources which experience and skill may have suggested, is there any other plan of treatment to fall back upon? Wearied with persistent efforts of cure, worn down by constant pain, with the present heartless, and the future obscure; in such a state of abeyance in the participation of life's work, and duties unfulfilled, I think that we are still justified in holding out some hope and reason in the vindication of our resources. We may therefore put before the patient the possibility of an operation curing her, provided that she is willing to take the risks of dangers along with the chances of success.

The operation consists in opening the abdomen, tying the veins of the broad ligaments, and removing the ovaries and tubes so as to bring on the menopause prematurely. That such a proceeding promises fairly I am satisfied: it requires some extended observation to collect a sufficient number of cases for record. This is a matter of time, for as varicose veins bear but a certain proportion to the total number of diseases of women, so the cases which obstinately resist all methods of treatment I have mentioned, must be a small average, and necessarily be a long time in making a show of sufficient number.

Cases suitable for palliative treatment are not at all infrequent, and may easily be picked out from those coming under notice; those entitled to submit to the radical cure are few. Two instances have come under my care and as they form types of a class I will shortly note them.

Case I.—Mrs. ——, aged thirty-seven. Pale, lymphatic temperament, average height. Four children; youngest nine years old. Has been ailing for between two and three years with pelvic pain, aching in the back, bearing-down sensations, leucorrhœa, and general ill-health. The symptoms are aggravated by standing, and especially by remaining any length of time in the erect position. She has hemorrhoids, varicose veins in the legs and inner aspect of the thighs, more marked on the left side.

She remained under my care for many months, and had previously consulted several medical men.

The uterus was low, perpendicular, the os and cervix catarrhal. There could be felt a distinct fulness bimanually in the region of the broad ligaments, but the ovaries could not be felt of unusual size. She improved at first under treatment, wore a Hodge's pessary for a long time, worked steadily at the pharmacopœia in the way of drugs as far as her intelligence would admit—for she belonged to a class of individuals who read their prescriptions and want to know the reason of every move in the way of treatment. She ultimately felt inclined to settle down as a permanent invalid. To arrest this calamity I proposed

to operate upon her and see if anything could be done in this direction for her cure. She gladly accepted the opportunity and her husband was sensible enough to concur. I found the broad ligaments enlarged, full of varicose veins, and palpably much distended. I tied these, near the uterus, and again at the sides of the pelvis, taking away a V-shaped piece which included the ovary. The Fallopian tubes I tied separately and also cut away.

There was no trouble or any untoward event in her recovery. She speedily got well, and has since improved more and more, until now, eighteen months after the operation, she declares herself better than she has been for many years. She is cheerful and able to perform all the ordinary functions of life, with no claim to the questionable appellation and still less the surroundings of an invalid.

Case II. was a single lady thirty-three years old, tall, fresh-colored and languid, wanting in spirit and vitality. She had never been well, she stated, since the advent of her menstrual life. Backache, pains in the pelvis, more so in the left side, hemorrhoids, vaginal discharge, and general lassitude. Menstruation lasted a week, was profuse, painful, and necessitated, or rather implied, rest in bed for the whole week: this had been so for some years. The uterus was larger than natural, lower in the pelvis, the ovaries could both be felt per rectum: they were enlarged, one prolapsed, and the broad ligaments were full and distended. She had dragged on for years of discomfort and inability to get about. Had taken quantities of medicine, been treated by massage, an infinite variety of local remedies, and subjected to all sorts of recommendations and opinions. Fifteen months ago I opened the abdomen. The varicose condition was even more marked than in the previous case. I took away a V-shaped piece of each broad ligament, the ovaries, and tubes. There was no drawback to recovery. Since then she has vastly improved, and is getting stronger still. At times she complains of remnants of the former pain, but they are transient only. I thought it better for her to wear a Hodge's pessary from the first to keep the uterus up until sufficient contraction had taken place in the ligaments. She is in better health than she remembers herself to have been.

It may be urged that the removal of the ovaries and tubes, by anticipating the menopause, produced the good result in this case. It may have aided the attainment of this, but the physical condition of the venous masses was too palpable to claim sole credit for the premature change; the alteration of the circulation may fairly be looked upon as the main factor of success.

TONSILLITIS.

By G. F. Boucsein, M.D.,
of Baltimore, Md.

The object of this paper is to present some observations made by me during the past two years, coupled with some interesting observations of others culled from the record in literature so far as it has been accessible to me.

Very little is known of the function of the tonsils. The tonsil is a conglomerate of follicles connected with each other by a network of cellular tissue; its surface (covered with a mucous membrane) is not unbroken, but has depressions called lacunæ or crypts. The commonly accepted opinion is that the only function of the tonsil is to secrete a viscid fluid, which is squeezed out of its lacunæ by a bolus of food in passing to lubricate it in its passage onward. Concerning their connection with the lymphatic system opinions differ greatly. Dr. R. Hingston Fox, in an article on the "Functions of the Tonsils," in the July (1886) number of the *Journal of Anatomy and Physiology*, expresses the opinion that these glands belong to the digestive and not to the respiratory tract, and that their function is to reabsorb certain constituents of the saliva in the intervals of the meals which would otherwise be wasted. He calls attention to the fact that their structure is similar to the solitary agminated glands in the intestines. He thinks that the view of their having an absorbent function is further supported by the strong evidence of the power of the tonsil to absorb morbid poisons directly from the saliva.

A. Fränkel[1] calls attention to the possibility of general septic infection originating in the tonsil, and Le Gendre[2] thinks the tonsils the seat of the initial lesion in scarlatina and diphtheria. A. Jacobi,[3] on the other hand, denies an intimate connection of the tonsil with the lymphatic system, and mentions the frequent occurrence of tonsillar diphtheria without systemic infection. Certain it is, however, that in childhood and youth, while the lymphatic system is most active, the tonsils are most liable to disease, and in later years, when the lymphatic circulation is quieter, the liability to those diseases in which the tonsils are affected becomes less.

Acute follicular tonsillitis is an inflammation of the mucous membrane of the tonsil, accompanied by considerable swelling, consisting of an inflammatory infiltration of the lymphatic follicles composing the gland. An extension of the inflammation to the connective tissue situated between the follicles constitutes what is called parenchymatous tonsillitis; and it may or may not go on to suppuration. The invasion is usually abrupt, though it may be preceded by a chill or by repeated chills. At the onset the patient becomes restless, irritable, and hot (the temperature rising to 104° or 105° F.), complains of headache, dysphasia, anorexia, and general lassitude; sometimes the patient complains of severe pains in all the extremities. The tongue is usually covered with a thick yellowish or yellowish-brown coating. Power to open the mouth to any great extent is lost, and swallowing, in some cases, is next to impossible.

[1] Annual of Un. Med. Sciences, 1888, vol. iii. p. 287.
[2] Ibid., p. 288.
[3] Med. Record, Nov. 27, 1886.

Inspection of the parts, internally, will show one tonsil, sometimes both, greatly swollen, of a bright red color, and often patches of a whitish or yellowish secretion adherent to the surface of the tonsil. There is more or less congestion of the anterior and posterior pillars of the fauces and uvula, and very often this extends to the pharynx.

My attention was especially called to this affection by the following case: In December, 1886, I was treating a lady for acute tonsillitis, and on the fourth day of her attack, when she was considerably better, I was asked to look at her little boy, seven years of age, who had had a chill the night before (he had spent the whole of the preceding day in the same room with his mother), and was now complaining of his throat. Examination revealed a follicular tonsillitis; his axillary temperature was 102° F., and he showed signs of considerable constitutional disturbance. This was about 10 A. M. That night I was hurriedly called to my patient: I found him delirious, with a temperature (axillary) of 103.5° F. I had my patient on ½ drop tr. aconite root, 1 gr. potassium chlorate, and 5 ♏ of the ammoniated tr. of guaiac every two hours. I ordered this dose repeated every half hour for three hours, and on the following morning his temperature had fallen to 102°. From this time on he steadily improved, and I discharged him on the sixth day of his attack as well.

Exactly three weeks after the last day of his sickness I was again called to see this little boy; his mother had noticed that his legs were swollen, and for two days she had trouble to get on his shoes; that morning she had noticed that his face was swollen, especially the lower eyelids. Between the time that the mother had sent for me and my arrival the boy had a convulsion, which was followed by another while I was at his bedside, and which ended in coma and death.

This boy had not complained since his attack of tonsillitis, three weeks before.

Although a post-mortem was not allowed, the death of the boy in uræmic coma would not leave much doubt as to the nature of his trouble. During his attack of tonsillitis he had no rash or eruption, nor did his tongue present the characteristic appearance of scarlatina; the diagnosis of diphtheria was negatived by the absence of any tendency to asthenia and by the absence of any glandular tumefaction about the neck.

Since my experience with this case I have carefully watched every case of tonsillitis that has come under my care, and I shall now give the result of observations made on forty-three cases seen by me during the past two years.

Age.—My experience is not favorable to the opinion of some authors who hold that acute follicular tonsillitis is a disease to which adolescents are peculiarly liable; I met with it only five times in adolescents. On

the other hand, Dr. Haig Brown,[1] the medical officer of an institution containing 500 boys between the ages of twelve and nineteen years, mentions that out of 127 consecutive cases during an epidemic 105 were between fourteen and seventeen years.

SEX.—Twenty-six of my cases were in the male, and seventeen in the female.

HEREDITY.—Six of my cases gave a distinct history of a family tendency to tonsillitis. (Nineteen cases gave a history of rheumatism, six personal, and the rest in the members of the immediate family.) In 127 cases observed by Dr. Brown,[2] 76 gave a history of a rheumatic condition.

CONTAGIOUSNESS.—I met with nine cases in which the disease was spread by contagion. In one house a man, aged twenty-five years, had an attack of tonsillitis; being an orphan and unmarried, he kept his little brother, aged twelve years, in his room to wait upon him, and on the third day the little fellow had tonsillitis. During the young man's illness he was visited by his fiancé, aged twenty years, who, on leaving him, gave him a "good, long kiss." The following evening, about twenty-four hours after the kiss, she was attacked with acute follicular tonsillitis, and, in turn, communicated it to her sister aged seventeen years.

In none of these cases was there any glandular enlargement; the onset in all of them was with high fever, and all had recovered fully by the fifth day, except the little boy, who was sick ten days. The other cases of contagion happened in three families: one case communicating it to three members of his family, another to two, and the last was a young husband who communicated it to his wife. Dr. Brown[3] records two epidemics, unquestionably spread by contagion. In three years he had 416 cases of tonsillitis, and only one of genuine diphtheria.

In discussing a paper on "Follicular Amygdalitis," read by Dr. Jacobi before the New York Academy of Medicine (November 16, 1886), Dr. J. Lewis Smith[4] mentioned its multiple occurrence in families, although he was not certain that the disease is contagious. Dr. Billington[5] had seen it occurring as an epidemic, several times, in populous neighborhoods, and recalled one instance in which it affected nearly all of the children in all of the families in a large tenement house.

Possibility of infection through other channels than the tonsils: Froelich,[6] an army physician, made an autopsy in the case of a soldier who died of peritonitis complicating follicular tonsillitis, during which both he and his assistant received slight autopsy wounds on the hand. On the same night Dr. Froelich had pain about the wound; on the

[1] Medical News, January 8, 1887, p. 44.
[2] Ibid.
[3] Ibid.
[4] Medical Record, November 27, 1886.
[5] Ibid.
[6] Deutsche med. Zeitung, viii. 1887.

following day he had lymphangitis of the arm with swelling of the axillary glands. On the second day the tonsils became affected with follicular tonsillitis. The assistant passed through a similar train of symptoms, only that the onset was two days later. Dr. Froelich's wife was also taken ill with tonsillitis. All made a good recovery.

I had one case in which, I think, infection took place in a similar manner: On October 10, 1887, Ullrich B., a brewer, was taken ill with an acute attack of follicular tonsillitis; on the evening of the 14th he was visited by Conrad P., a fellow-workman. While cutting some plug tobacco Conrad cut himself in the hand, and "took hold of the nearest thing to him to wipe away the blood;" this thing happened to be Ullrich's handkerchief. On the morning of the 16th I was sent for, and found Conrad suffering from an acute attack of follicular tonsillitis, and complaining of pain in the left axilla. His axillary glands were swollen, and he gave a history of two severe chills the evening before. Ullrich B. recovered on the 16th and Conrad on the 20th. The onset in Conrad was quite severe; his axillary temperature on the sound side, when I first saw him, was 103.7° F.

TEMPERATURE.—The axillary temperature at the onset in my cases ranged from a little above normal to 104.5° F.—generally between 101° and 103° F. In those cases in which the temperature was low at the onset it generally rose from 1° to 3° on the second or third day.

PULSE.—In most cases the pulse was full and rapid; but I had three cases in which it was rapid and quite feeble.

DURATION.—The longest uncomplicated attack that I saw lasted seven days; the shortest, two days. Three and a half days was the average.

COMPLICATIONS.—*Albuminuria* is often present in febrile diseases with high temperature, and so it is in tonsillitis. I met with it five times in my 43 cases. Actual renal trouble—acute nephritis—I saw once. (The case of the little boy I mentioned in the beginning of this paper is not included in this study of 43 cases.)

Joseph H. was taken sick March 6, 1888, with acute tonsillitis. On the 9th, feeling better, he went out without my permission, and as a result of this indiscretion had a relapse of his trouble. His temperature on the morning of the 10th was 104.5° F., two degrees higher than on the first day of his illness; the constitutional disturbance was very much greater. On the 15th I noticed puffiness of the lower eyelids and œdema of the legs. His urine was again examined, and found loaded with albumin. There was no heart trouble. I put my patient on Basham's mixture and Buffalo lithia water; by the 22d all dropsy had disappeared and on the 25th the urine contained no trace of albumin.

Here, then, is a case of acute Bright's disease complicating tonsillitis, and that nothing more than tonsillitis was present was shown by the fact that follicular tonsillitis was communicated to the patient's wife, who

ran through her *first* attack in four days, from the 12th to the 15th of March. Further, the only child of this couple, aged fifteen months, being confined, during the mother's illness, in the same room with its parents, was also taken sick, on the 15th. There was nothing more than considerable congestion of one tonsil; the temperature was 101°; and by the evening of the 17th all local signs of trouble had disappeared, but fever was still present and the child was very fretful. Examination on the morning of the 18th revealed all the signs of the first stage of lobar pneumonia; the lower lobe of the right lung was affected. The child went through all the stages of pneumonia, and did not fully recover until April 11th. Now, whether the pneumonia of the child had any connection with the tonsillitis of the parents, or not, I do not know. Anyhow, on the 29th of March, its mother, who had been very attentive to it and was constantly about it, was again attacked with tonsillitis which ended fatally on the night of April 3d. The cause of death was œdema of the epiglottis.

Dr. S. Seabury Jones[1] reports a case of abscess of the lung, non-tubercular and non-metastatic, in which suppurative tonsillitis was the initial lesion.

Heart. Dr. Haig Brown[2] mentions that, of 345 cases of acute tonsillitis in which there was no history of previous rheumatism, 33 developed a cardiac murmur. Of these cases, 8 were systolic basic murmurs heard over the pulmonary artery; 18 were systolic basic murmurs; 2 were pericardial friction murmurs; 1 had pericardial friction with systolic apex and diastolic basic murmurs; 4 were combined systolic and presystolic bruits. Eight of the cases of endocarditis terminated in chronic valve disease.

I had two cases in which a systolic apex murmur was developed; both disappeared—one in two weeks and the other in four weeks. Both cases were females; in both was the invasion of the tonsillitis severe. In one case the signs of tonsillar trouble disappeared on the fourth day; this was the case in which the heart murmur persisted for four weeks. In the other case the tonsillitis lasted six days. Neither had had rheumatism. Moreover, I have now under my care a case of mitral insufficiency in a lady who has no history of any previous sickness except tonsillitis.

Orchitis and ovaritis. I have met with neither of these complications. Joal,[3] a French observer, in a study of the subject, sums up as follows: (1) Orchitis and ovaritis should be classed among the complications of acute tonsillitis, either superficial or deep. (2) These genital manifestations, analogous to those which appear in typhoid fever and mumps, should be attributed to the infectious nature of the tonsillar inflamma-

[1] Medical News, March 2, 1889, p. 247.
[2] Archiv. Gén de Méd., i. 1886.
[3] Ibid., January 8, 1887, p. 44.

tion. (3) The orchitis and ovaritis are not due to any of the alleged physiological sympathies imagined by certain authors as existing between the generative organs and the tonsils.

Typhoid fever. De Gassicourt[1] reports three interesting cases in whom tonsillitis was the first symptom of typhoid fever. One case, a boy, thirteen years of age, vigorous and, when first seen, delirious. The pulse was rapid, the skin hot, the submaxillary glands swollen, and the tonsils and soft palate covered with a yellowish-white exudate. While he was in doubt as to the diagnosis of diphtheria, symptoms of typhoid fever developed, and the patient died on the twenty-fifth day. The other cases were children in whom the tonsillitis was quite severe, and terminated in a moderately severe typhoid fever; both patients recovered.

Peritonitis. Froelich[2] reports a case in which peritonitis complicated tonsillitis.

Rheumatism. I had one case, a boy, eleven years old, in whom all the symptoms of acute rheumatic fever developed during an attack of acute tonsillitis; he gave no history, either personal or family, of rheumatism. The invasion of the tonsillitis, in this case, was quite severe; his temperature 103°; his pulse full and rapid, and the skin hot. On the third day of his illness he complained of pain and swelling in the right knee, and on the fourth day in the left knee. He had profuse perspiration, and the urine showed a reddish sedimentary deposit on standing. He was put on salicylate of soda, and on the tenth day he had fully recovered.

Glandular tumefaction. In three of my cases, uncomplicated, there was enlargement of the submaxillary glands.

Œdema of neighboring tissues. The occurrence of œdema of the glottis, epiglottis, the soft palate, and uvula is known, and some fatal cases are reported. I had one fatal case of œdema of the epiglottis.

It was the case of Mrs. H., who had two attacks of tonsillitis within three weeks; in the second attack the tonsil suppurated, and was spontaneously evacuated, much to her relief, on the morning of the sixth day. (I was not allowed to use a bistoury.) That night she and her husband sat up late, both in good spirits; at twelve P.M. she took a dose of her medicine, a resin guaiac mixture; she had hardly swallowed it when she cried out that she was choking. Her respiration was at once labored, and in a minute more inspiration was impossible; with each expiration she cried out, and in two minutes more breathing ceased altogether.

All of this happened in the presence of her husband, an intelligent man, from whom I got the history. As soon as he could, he sent for me, and when I arrived at the house she had been dead thirty minutes; her extremities were cold, and she was beyond all hope of resuscitation.

[1] L'Union Médicale, March 15, 1888.

[2] Deutsche med. Zeitung, viii. 1887.

Putting my finger in her mouth, I could feel, at the base of the tongue, the immensely swollen epiglottis.

There are several cases on record in which the tonsillar abscess burst during sleep, causing alarming symptoms of suffocation. Dr. Way[1] reports one fatal case. Examination after death revealed the fact that the upper pharyngeal region and the larynx were filled with pus and broken-down tonsillar tissue.

Several cases are also reported where spontaneous evacuation of tonsillar abscess was accompanied by severe hemorrhage. Poshensky[2] reports a case in which ligation of the common carotid artery was necessary to stop the bleeding. Hall[3] reports a fatal case of hemorrhage in a man of twenty-six. This man had suffered from repeated attacks of suppurative tonsillitis, and Hall believes that the walls of the carotid were weakened by the process of ulceration.

DIAGNOSIS.—*Scarlatina.* In the commencement of scarlet fever, prior to the eruption, there are no symptoms or appearances which enable us to make a positive diagnosis. Still, history of exposure to scarlet fever, and vomiting, which is rare in tonsillitis, should leave little doubt as to the nature of the case before us. Later, the appearance of the rash and the characteristic appearance of the tongue make the diagnosis certain.

Diphtheria. The diagnosis from diphtheria, when the membranous deposit spreads from the tonsil to the soft palate, uvula, and pharynx, is easy; but when the diphtheria remains tonsillar the differentiation is very difficult, and especially so in the variety known as punctate diphtheria.

In tonsillar diphtheria, as in acute tonsillitis, the invasion may be abrupt, with high fever and a full and rapid pulse. There may be no glandular enlargement behind the angle of the jaw; there may be no albuminuria; the deposit may have a yellowish tinge; but, while it may prove an innocent affair, as far as the person affected is concerned, it can spread most violent diphtheria. This has happened to me. In a case that I had, the abrupt invasion; the initial high temperature; the absence of glandular tumefaction and albuminuria; the patient, a boy, showing no tendency to asthenia, and the yellowish color of the deposit, made for me the diagnosis of tonsillitis, and no attempt was made to isolate the case. This case brought on ten cases of violent diphtheria in his own and two neighboring families, seven of which died.

The differentiation between the two diseases is made in the following manner: in follicular tonsillitis the exudate can usually be brushed away; when it becomes dry and membranous in appearance it can

[1] Medical Record, Feb. 25, 1888.
[2] Annual of Univers. Med. Sciences, 1888, vol. iii. p. 292.
[3] Boston Med. and Surg. Reporter, Dec. 22, 1887.

easily be detached with a forceps, whereas a true membranous deposit is adherent and, if forcibly detached, leaves a raw, and very often bleeding, surface. In those cases in which the deposit is punctate and where it cannot be wiped away: in the follicular cases a probe can be made to enter the lacunæ of the tonsil, between the exudate and the wall of the lacuna; in the true membranous cases, the membrane being adherent to the wall of the lacuna, this is impossible.

In view of the difficulties attending a correct diagnosis, I am inclined to decide with those writers who think it better to err on the safe side and isolate all cases of follicular tonsillitis as if they were cases of diphtheria.

The fact of the occurrence of tonsillitis during epidemics of scarlet fever and diphtheria, and that when we have much tonsillitis we will meet with cases of scarlet fever and diphtheria, is very interesting, and leads some authors to the opinion that there is a certain relationship between tonsillitis and the two specific fevers. Fox[1] says: "There is some reason for regarding scarlatina and diphtheria as essentially forms of tonsillitis which have acquired the power of infecting the system generally. The virus of these two fevers may probably enter the lymphatic system through the tonsil, producing tonsillitis as a primary effect. He thinks "there is nothing in the occurrence of scarlatina and diphtheria of wounds, and of mucous surfaces other than the fauces, to contravene the hypothesis that the poisons of these diseases in ordinary cases enter at the tonsil."

Herpes of the tonsil. Mild herpetic angina, in which the eruption is limited to the tonsil, is extremely rare, and when it does occur it should offer no difficulty in diagnosis—the vesicular eruption is characteristic.

Primary sarcoma of the tonsil. Two cases of this affection have been reported this year, one by Dr. MacCoy,[1] the other by Dr. Gray.[2] Gray collects eighteen cases reported since 1869. MacCoy calls attention to the "want of distinctive features while the tonsil alone was involved, having all the appearances of a tonsillar inflammation." Croly[3] reports two cases which were first treated as tonsillitis.

A case of tonsillar trouble, having the appearance of mild tonsillitis, without fever and without much constitutional disturbance, persisting for a week or more, should excite suspicion, and the aid of a microscope should be used to make a diagnosis.

Chancre of the tonsil. This might be mistaken for tonsillitis. The appearance of a sore on the tonsil with early enlargement of the glands at the angle of the jaw is diagnostic. These cases generally happen in

[1] Lancet, ii. 1886.
[2] Med. News, Feb. 2, 1889.
[3] American Journal of the Medical Sciences, ii., 1889.
[4] Transactions of Academy of Med., Ireland, v. 1887.

those who are in the habit of using the same pipes, eating and drinking utensils with others suffering from syphilis.

TREATMENT.—The treatment of tonsillitis may be divided into prophylactic, local, and constitutional. The *prophylaxis* of tonsillitis has special reference to the treatment of those cases of hypertrophied tonsils which take on frequent attacks of acute tonsillitis. Indeed, all enlarged tonsils are specially liable to attacks of the inflammation. An interesting fact may be mentioned in this connection: Out of 2000 children examined by Dr. Chappel[1] in New York City to determine the frequency of certain abnormal conditions in the throat and nose, 270, or 13½ per cent., had enlarged tonsils, and then only those presenting very considerable enlargement were noted.

The usual treatment for enlarged tonsils is tonsillotomy, either with the bistoury or with the tonsillotome. This operation is comparatively easy, but the reports of cases of alarming and obstinate hemorrhage after it are not so rare as to encourage the belief that it is simple and free from danger. The treatment that has received the strongest recommendation of late is that by the galvano-cautery; this can be applied in two ways: with the galvano-caustic snare, or with the sharp-pointed electrode.

The *écrasement* with the caustic snare requires some skill; care must be taken that the platinum wire is closely adjusted to the tonsil; that all of the gland that is to be removed is not included, and that the heated wire does not come in contact with the pillars of the fauces or other parts. These precautions are necessary, because the heated wire will cauterize that part of the gland that remains, and because burning of the other tissues of the throat will cause intense pain and may give rise to considerable œdema. A No. 30 platinum wire is the best to use; it must be heated to red-heat, and must only be tightened during the passage of the current.

The treatment with the sharp-pointed electrode, igni-puncture as it is called, though not so rapid as with the snare, has these advantages over it: (1) It is more easily managed, and (2) it causes a great deal less pain, and none after the preliminary application of a 4 per cent. solution of cocaine. The application is simple: under red-heat the electrode is plunged into the tonsil to the depth of a quarter of an inch, held there for a moment and then withdrawn. A second and third puncture may be made at the same sitting; four to seven days must elapse between the sittings, and from three to five sittings will be necessary to contract the tonsil.

The after-treatment after each sitting, and after the use of the snare,

[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, ii., 1889.

consists simply in the use of alkaline gargles. Seiler[1] prefers, when the tonsil is hard, the use of the Jarvis snare; he adjusts the wire over the tonsil himself and gives the instrument over to the patient, who does the tightening. In this manner the operation is done with but little loss of blood; the patient, to save pain, operates slowly, taking from two to three hours to complete the operation.

Von Hoffman[2] holds that hypertrophy of the tonsil is due to the conversion of the lacunæ into cavities filled with viscid secretion and pus. He claims to have good results by tearing these cavities open with a tenaculum.

The results obtained by the use of injections of caustics and astringents into the hypertrophied tonsils are not so satisfactory as the results obtained by the employment of other means.

Local treatment. The application of the alkaline salts, as borax and sodium bicarbonate, either in warm solution as a gargle, or in powder, to the inflamed tonsil is strongly recommended by Baker[3] and Oliver.[4] LeBrun[5] uses a gargle composed of boric acid 8 parts, Eau de Pagliari 40 parts, and water 250 parts, and follows this up with the application to the tonsil of iodoform collodion. Morell Mackenzie[6] uses bismuth and opium, or $\frac{1}{8}$ gr. of morphia with $\frac{1}{4}$ gr. of starch, locally; later in the disease he gives inhalations of benzoin, hop or conium, and applies poultices to the outside of the throat. As soon as he finds fluctuation, he makes an opening into the abscess. Von Hoffman[7] wraps a wad of cotton as thick as a little finger around the point of a dressing forceps; dips this in a mixture of equal parts of tincture of iodine and glycerine and with it applies pressure (squeezes) to the tonsil, which is supported by a finger on the outside. He says this method causes some (?) pain, but the relief obtained is so great that patients will ask for a repetition of it.

Cocaine has been applied to the tonsil to relieve pain and to diminish the blood-supply. De Haviland Hall[8] sprays the throat with a solution of sodium bicarbonate, 10 grs. to the ounce, and then applies a 20 per cent. solution of cocaine to the tonsil; this is repeated in ten or fifteen minutes if no relief is obtained from the first application. The applications are made from one to three times a day as long as the patient is sick. In view of the toxic qualities of cocaine, I would look upon this treatment as dangerous.

[1] New York Med. Presse, June, 1888, p. 285.
[2] Medical News, Nov. 26, 1887.
[3] Annual of Univ. Med. Sciences, 1888, vol. iii. p. 289.
[4] Ibid.
[5] La Clinique, i. 1887.
[6] Medical News, January 26, 1889.
[7] Medical News, November 26, 1887.
[8] British Med. Journal, i. 1888.

The only local treatment that I use, and with good results, consists of poultices to the outside of the throat, inhalations of steam, and incision when there is abscess.

Constitutional treatment. The use of the tincture of aconite root, the ammoniated tincture of guaiac, and potassium chlorate with tincture of iron is so well known that it need not be mentioned here. Morell Mackenzie[1] insists that he has better results from the resin guaiac in powder (lozenge) form than in the tincture form. Sodium salicylate, 15 to 20 grains every three or four hours, is strongly recommended. I use it in rheumatic cases with decided benefit.

Boisliniere[2] strongly recommends the sodium benzoate; he reports seventy-five cases in which he simply gave the following mixture:

℞.—Sodium benzoate . . . . . ʒj–ʒiv.
Glycerine. }
Elixir calisaya bark } . . . . . āā ℥j.—M.
D. Sig.: ʒj every hour, or every two hours.

Of the 75 cases, 41 reported well in twelve hours, 31 in twenty-four hours, 3 in thirty-six hours; average, twenty hours. In private practice, when cases could be watched more closely, he has seen the white cheesy points disappear in from eight to ten hours. He finds that sodium benzoate undoubtedly controls the febrile elements in the disease; that it may be given with impunity even to children, and that it produces no bad or disagreeable effects.

This is, indeed, a brilliant showing, but in my hands the remedy has done no better than any of the others that I have used. I tried it in 10 cases; 3 reported well in two days, 2 in three days, 4 in four days, and 1 in six days. Average, three and one-half days—just about the same results that I get from any other remedy.

I am very sceptical as to the curative or abortive power of any remedy in acute tonsillitis; I believe it to be a specific disease which will run an average course of three and one-half days, in spite of all we can do for it. I can recall two cases in which nothing but poulticing and steam inhalations was done, and both recovered fully by the fourth day. In one case my prescription had not been filled; in the other, a servant girl, the medicine was thrown regularly in tablespoonful doses into the water closet. Remembering this, I, in my own case (last winter), did nothing but make myself as comfortable as possible, and on the fourth day I was well.

[1] Medical News, January 26, 1889.
[2] Ibid., March 3, 1888, p. 237.

A CONTRIBUTION TO THE MANAGEMENT OF INITIAL MYOPIA ACQUISITA.[1]

By S. O. Richey, M.D.,
of Washington, D. C.

The emmetropic, or the non-progressive slightly myopic, eye is best suited to the occupations of civilized life, because it has most endurance when taxed by objects within the limit of distance at which rays of light sensibly diverge. Hyperopia is the typical refraction; "the refraction of neonati is exclusively hyperopic."[2] That this condition persists, or changes but slightly, in the lower animals and in human beings who lead an out-door life, away from occupations requiring precise ocular attention to objects within the length of the arm; that the refraction increases with the years of an individual up to twenty-five, and beyond, if he be engaged continuously with small objects near him, are points established by statistics.

The hyperopic eye, unlike the emmetropic or myopic eye, is to a greater degree a vital organ, rather than an optical machine arranged for a given class of work. It has more life and adaptability, adjusting itself for the *best* definition of images at different distances and of varying sizes. Objects appear more brilliant to it—because, it accommodates for *every* object at whatever distance, and the ciliary muscle is better developed by this constant exercise; and because, with this constant effort at accommodation are associated movements of the choroid and retina, the perceptive elements being thus kept in a constant state of healthful tension. Objects are smaller and brighter, and more clearly defined.

A hyperope can see farther and more accurately when the atmosphere contains more than the usual amount of moisture, or in a fog; myopic vision is increased by such conditions.

Nature did not build eyes for vision limited to twenty feet, though she adapts, or endeavors to adapt, them to the uses to which they are subjected. Hence, the increasing tendency to myopia in civilization, for the percentage of myopia in a given race is an approximate measure of its civilization. The myopic eye can work in a *lower* illumination on account of the apparent size of the objects, which it magnifies.

Myopia and chronic nasal catarrh are *vestigia* of luxury. Houses exclude light, distance, and cold air; the handkerchief is limited to the civilized human being.

How does nature, in her effort to adapt the human eye to its environ-

[1] Read at the meeting of the American Ophthalmological Society, July 18, 1889.
[2] Koenigstein, Wien. med. Journ., p. 47, 1881.

ment, change hyperopia into myopia, or myopic astigmatism? This is the question with which this paper will attempt briefly to deal; for, with a clear conception of the *modus operandi* of structural changes, we have positive indications for the prevention of such processes.

In accommodation, the ciliary muscle, by its contraction, advances the choroid, and with it the retina. This action of the muscle has been observed through a sclero-corneal incision opposite the muscle, and also by the swaying of the heads of pins stuck perpendicularly into different parts of the choroid (Hensen and Voelckers). This movement of the choroid increases the pressure of the corpus vitreum on the lens: the lens is carried against the iris, which being contracted offers resistance to the lens, except in the pupillary space where the lens becomes most convex. Whether the lens becomes more convex by its own elasticity during relaxation of the zonule, or, whether the circular fibres *press* by their ciliary processes on the equator of the lens (Müller), it is unnecessary to the purpose of this discussion to decide. We are also to exclude that class of myopia into which inherited tendency enters as a factor, so far as this is indicated by its existence in some progenitor, and limit our consideration to the action of the most potent cause of myopia, *ab initio*.

Among civilized people the objects which engage their attention from earliest childhood are, for the most part, included within the four walls of a room; generally within reach of their hands. After having fixed the mode of production of myopia, it will be proper to decide if it be best to *prevent* it, that being possible; if it be best to prevent entirely our adaptation by nature to our changed environment, or to limit only this process of adaptation. This is a question to be studied and discussed in the interest of coming generations, with a view to its settlement by ourselves, or others.

A slightly myopic eye seems best suited to the needs of present training, and trained occupations, though it would not have been so effective in the pastoral and nomadic modes of life of the past. It is better suited to a race of students and to kindred employments. The danger lies in the too rapid enforcement of the structural changes necessary. If these could be limited in the individual, and reach proper development slowly through several generations, each one bearing its own share of the adaptation, disease processes might be avoided, and, with this, the inherited tendency to certain affections of the eye. No one organ can be good for everything. The hyperopic eye was perfect for its uses in the past, but it has, in a measure, given way to the so-called emmetropic eye, which must in turn be superseded by the eye of still higher refraction, with the least damage from the process.

The hyperopic eye always exercises some accommodation to secure definition of image, even at infinite distance, and the demand upon accommodation increases in inverse ratio to the size and distance of the

object. Such eyes are rarely at rest. The anatomical peculiarities of the region supplied by the trigeminus are not fixed until after the period of second dentition, during which the greatest exactions are made upon it by our methods of education and preparation for the future duties of life. Tonic ciliary spasm simulating myopia, or myopic astigmatism, is not infrequent. Schweigger says myopia is often developed in children after measles, or scarlet fever; diseases which offer a legacy of muscular asthenia predisposing to muscular spasm of taxed muscles, of which the ciliary muscles are most prominent, as during convalescence they are most relied upon for amusement.

Constant and excessive action of the ciliary muscle causes disturbance in the uveal tract by the continuous motion of the choroid, with the alternate compression and relaxation of the bloodvessels resulting from it. The advancement of the choroid and corpus vitreum means an increase in the antero-posterior diameter of the bulb. With this state of things persisting while this whole region is adapting itself during the period of second dentition and diminished general vigor, especially after the exanthemata, is it surprising that the eye should become fixed with an abnormally long antero-posterior diameter? This shape and position having been maintained for some months the tissues lose their resiliency, and when the spasm is relaxed, the eye does not promptly, if ever, recur to its former condition. This mishap occurs too upon the threshold of the sexual life, when the slightest influences have an exaggerated and permanent effect. The myopic process begun at this time is with difficulty interrupted, though it may sometimes be limited by prompt and decided measures, unless in case of inherited tendency.

Irritation of *one* ciliary nerve may cause contraction of the ciliary muscle and the iris, and the advancement of the choroid and vitreous body in the *one* section to which it is distributed. Thus, astigmatism may be inaugurated. To object that astigmatism depends upon asymmetrical curvature of the cornea, is to lose sight of the fact that when the vitreous is advanced it is probably narrowed, that the shape of all the tissues is modified, the cornea as well as the rest.

If the, at this time, temporary malformation of the bulb, and the associated uveal excitement, are not restored to the previous conditions, the prospect of recovery grows less, and inflammatory disturbances of the fundus may supervene.

The means at our command for the accomplishment of this purpose are simple, based upon the rational indications, and have been found effective. If not all elasticity of the tissues is lost by delay, the persistent use of atropia in suspending accommodation will permit a recurrence to the earlier refractive power; and, by the rest it affords, relieve the choroido-retinal perturbation. A solution of atropia, 1 : 120 parts, should be used, one drop in each eye, every second, third, or fourth day, *pro re*

nata; combine with this a London-smoke + lens, as strong as is tolerated, to be worn, and for a necessary time all near-work must be suspended. Some months are required to gain the best effect, which is the chief impediment to success. The true American, the child as well as the adult, living in the same atmosphere of nervous excitement, and impressed with an exalted idea of the importance of what he is endeavoring to do and the short space of time in which it must be done, has no appreciation of the conservation of energy. He has a life to live, and wants to get through with the *business.* He looks upon physical integrity as an accomplishment, rather than important to the real purpose of life. He is very impatient of time *lost* in securing to himself the physical advantages already possessed, and will probably more than once infringe the rules given for his guidance and risk the success of the effort made in his behalf. After the *best* effect of the mydriatic has been secured it may be suspended, the length of time the eyes may be used is arranged, the strongest + lens through which the individual can read at 36 cm. distance is prescribed, and he is to be forbidden to approach the object more nearly. He is to read nothing that cannot be easily seen at the given distance with the lens. This plan, repeated as necessary, will establish the improved condition, in a length of time varying with different individuals.

I hereto append a few cases in point:

Case I.—*June* 19, 1882. Miss M., aged thirty-two. Since 1876 has noticed that she could not recognize acquaintances across the street. Has had pain in her eyes for four months. Her vision is worse after concentration for a time upon some near object; has decided photophobia and often congestion of the bulbar conjunctiva. V., each $= \frac{20}{cc}$. Reads Jaeger's No. 1, easily with either eye, at 12 in. With — 3 Ds., V., each $= \frac{20}{xx}$. A solution of atropia, 1 : 240, and a + .5 Ds. lens for reading were prescribed to relax A. (as has since been suggested by Landolt in his work on *Accommodation and Refraction of the Eye*).

August 1. + 1. Ds. each was prescribed, and the atropia was continued.

August 10. V. each $= \frac{12}{c}$.

January 11, 1883. Under this treatment continued V., each $= \frac{20}{c-}$.

November 12. No farther improvement, and — 1.75 Ds. were prescribed for distance, giving V., each $= \frac{20}{xx}$.

July 16, 1884. I examined the eyes again with the same result.

Six years is a long time for tonic spasm of the ciliary muscle to exist without some structural change, which had taken place in this case, probably. After thirty, the tissues naturally have less elasticity than

earlier in life. The patient was a government employé and was compelled to continue desk-work during the treatment. These three facts may explain why success in this case was not better even than it was.

CASE II.—*July* 29, 1882. F. C. H., aged twenty, a student of civil engineering, complains of nothing except indistinct vision for distant objects. V., each $= \frac{20}{LXX}$; with $-$ 2 Ds., each $= \frac{20}{XX}$. Reads Jaeger's No. 1 at 21 in., and at 5 in.

He was seen at intervals until February 4, 1884, and under the treatment carried out as well as possible while the young man was attempting to keep up with his class, with — 1.25 Ds., V., each $= \frac{20}{XX}$.

July 22, 1884. The same condition existed. His mother is a myope.

CASE III.—*February* 3, 1886. F. L. H., a schoolboy of twelve years. He is small, and does not look strong, though ordinarily vigorous by report. He is very fond of books, and reads nearly all the time in bad light and in awkward positions. Distant objects "are blurred; not clear as they used to be." V., each $= \frac{20}{XX-}$. Prescribed — .75 Ds., for distance only, with instructions to maintain *always* a distance of fifteen inches from his book, to read in a good light, not lying down.

October, 1888. He returned with V. R. $= \frac{20}{LXX-}$; V. L. $= \frac{20}{LXX-}$.

V. R. =, with — 1.25 Ds., $\frac{20}{XX}$.

V. L. =, with — 1. Ds., $\frac{20}{XX}$.

Subjected to the course of treatment indicated, with cold-water douche to the eyes, he has gradually improved as the following tests declare:

Nov. 10. V. R. $= \frac{20}{L}$; 20th, $= \frac{20}{XL}$; Dec. 22, $= \frac{20}{XXX}$; Jan. 19, $= \frac{20}{XX}$

" V. L. $= \frac{20}{L}$; " $= \frac{20}{XL-}$; " $\frac{20}{XXX}$; " $= \frac{20}{XX}$

February 1. The atropia was suspended, while the + .5 Ds. lenses were continued, but February 9th, having recovered from the influence of the mydriatic, V. was slightly blurred.

July 1, 1889. The result of the test, V., each, $\frac{20}{XX}$.

CASE IV.—*June* 16, 1888. W. W., aged seventeen years, consulted me in great distress. He had been rejected, upon a physical examination for West Point, the Examining Board having reached the conclusion that there was myopic astigmatism of the right eye, and myopia of the left eye. Upon examination, V. R. $= \frac{20}{LXX}$; V. L. $= \frac{20}{XX-}$. Jaeger's No. 1 could be read easily at 12 inches. After the instillation of atropia he was again examined.

18th. V. R. $= \frac{20}{LXX}$; 19th, $\frac{20}{LXX}$; with — 1. Ds. $= \frac{20}{XX}$; 26th, $= \frac{20}{XXX}$

" V. L. $= \frac{20}{XXX}$; " $\frac{20}{20}$.

The last part of July, V. R. $= \frac{20}{xx}$, under the continued treatment.

He was advised to abandon his intended plan of going to West Point, because the integrity of his eyes could not be preserved under the exactions to which they would be subjected there, and he would be rejected at the close of his term. This course was followed, and he has since been studying at home.

September. V., each $= \frac{20}{xx}$. He used his eyes in a bad light, and in December, V., each $= \frac{20}{xx-}$.

February 19, 1889. He has been using his eyes six or eight hours daily since early in December, in reading, maintaining a proper position and with a good light, without manifest disadvantage. V. $= \frac{20}{xx-}$, each.

The father had hyperopic astigmatism of both eyes. An elder brother, whom I examined in June, 1883, when near the end of his course at the Naval Academy, at Annapolis, had a compound myopic astigmatism of about 5 D., which I suspect has increased. Of two sisters, the elder at eighteen years was myopic: R. E. = 2. D.; L. E. = 1.25 D. The younger, October, 1882, eight years old, was hyperopic, 1.25 D., and during the more than six years that have elapsed, the refraction has not varied. She has been going to school during this time, and has been under my observation. She has worn a correcting glass, read in proper position, and maintained the proper distance between her eyes and her books. She has developed well, though she had grown so slowly until she put on lenses that her parents feared she would be dwarfed. The influence of the glasses was proven by the prompt growth of the child immediately upon their adaptation.

The relief, and the gain in general nutrition and strength, afforded by the timely use of proper convex lenses in hyperopia show the exhaustive effort required of the ciliary muscle by our civilized surroundings. Unless some rational and systematic mechanical method is adopted in anticipating and avoiding the evils which result, nature will compensate for the continual demand upon the ciliary muscle, by modifying the eye to suit the altered conditions, in order to save the rest of the body from exhaustion, and from the arrest of development arising from overtaxing one set of muscles at the early age at which our children are subjected to our forcing educational methods.

Shall we interfere by artifice with nature's process in adapting the eye of the Past to the needs of the Present, until what is best can be settled? Or, shall we permit the young to drift into danger from progressive myopia, and the evils it entails upon themselves and their posterity by inheritance?

A concave glass is only an attempted compensation for mischief accomplished in part, or in whole.

A CASE OF MODIFIED LARYNGECTOMY FOR EPITHELIOMA OF THE LARYNX; RECOVERY.

By George R. Fowler, M.D.,
Surgeon to the M. E. Hospital, and St. Mary's Hospital, Brooklyn, N. Y.

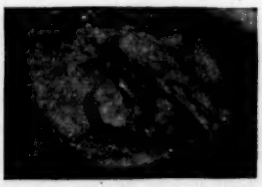
On November 12, 1888, Mrs. C. D., aged fifty-eight, married, was admitted to my service at the M. E. Hospital, with the following history: For the past two or three years the patient has noticed a gradual and progressive hoarseness. Five months preceding admission, she first consulted me for the relief of this hoarseness, which very shortly thereafter amounted to complete aphonia. Laryngoscopic examination at this time revealed a neoplasm upon the anterior portion of the left vocal cord, and I referred her to my friend, Dr. T. R. French, of this city, for further examination and advice concerning the necessity for an immediate operation for the removal of the growth. He confirmed my diagnosis of malignant disease of the larynx, and agreed with me in the desirability of attacking the growth and that the extra-laryngeal method of operation was the only one justifiable under the circumstances.

She returned to her home in the country to make preparations for the operation, intending to return in the course of a fortnight. During the next few months I heard, through a friend, that a decided improvement had taken place in her voice, and that, encouraged by this fact, she hesitated before accepting my advice. I requested that she return to the city, in order that another examination be made, to which request she acceded, and in November she again visited Brooklyn, and allowed me to re-inspect her larynx. It was then found that the growth had considerably increased in size, the visible portion projecting well beyond the free margin of the vocal cord, and occupying most of its length.

Fig. 1.

Showing parts during ordinary respiration. (Hemi-tone, after a photograph by Dr. T. R. French.)

Fig. 2.



Showing parts during phonation. (Hemi-tone, after photograph by Dr. T. R. French.)

The improvement in the voice was evidently due to the fact that, whereas, when the aphonia was complete, the left vocal cord was so crippled by the growth that its function was practically abolished, later on, as the growth increased in size, the right vocal cord could be brought into contact with the former, and thus phonation was reëstablished.

Dr. French again examined her at this time, and succeeded in photographing the parts as they appeared, both in ordinary respiration and

in phonation (Figs. 1 and 2). It was decided to give her the benefit of an extirpation of the larynx by the modified procedure suggested by Prof. J. Solis-Cohen, of Philadelphia, but which, up to this time, had never been performed upon the living subject.[1] Accordingly, on November 13th, the day following her admission to the hospital, a low tracheotomy was performed, preliminarily; in order to accommodate an extra large sized tracheotomy canula, an oval piece was removed from the front wall of the trachea. A few superficial sutures were applied, in order to close the wound below the tube. The parts were dressed with an artificial cuticle of collodion and sub-iodide of bismuth.

On November 17th, four days following the tracheotomy, it being found that complete toleration of the presence of the tracheal canula had been established, the operation of modified laryngectomy was performed in the presence of Prof. J. Solis-Cohen, Drs. T. R. French, B. F. Westbrook and Bryson Delavan, together with the hospital staff. The anæsthetic used was nitrous oxide, administered by Dr. George W. Brush, of this city. The method of administering the anæsthetic was by means of a coupling made to fit the opening of the tracheal canula, and attached by a piece of flexible tubing to the ordinary inhalation apparatus of the dentists. Inasmuch as the operation differed in one or two particulars from the procedure suggested by Prof. Solis-Cohen, I have thought it best to describe the different steps of the operation in this the first application of the new method. The operation as performed by myself is as follows:

An incision was made from the upper border of the hyoid bone to the first ring of the trachea. This was afterward extended to the tracheotomy wound. The structures overlying the thyroid were separated from about one-half to three-quarters of an inch on either side of the angle of junction of the two wings of this cartilage; the isthmus of the thyroid body was divided with the thermo-cautery. The crico-thyroid muscles were divided near their attachments to the thyroid cartilage, the soft parts were retracted to either side, when, all hemorrhage being arrested, the cricoid cartilage was separated from the first ring of the trachea by a transverse incision. The stump of the trachea was drawn forcibly forward and rapidly packed with gauze by an assistant, while the cross incision was being made. A silk ligature was passed through the first ring of the trachea and tied in a loop, in such a manner that the stump of the trachea could be drawn well forward. By means of narrow-bladed angular forceps each wing of the thyroid was split down to the crico-thyroid membrane at a point about one-quarter of an inch on either side of the angle of junction of the two wings. The interior structures of the larynx were now cleared from the inner surface of the thyroid cartilage; the mucous membrane of the right side peeled off easily, but that on the left side proved to be hard and somewhat unyielding, although it finally separated completely from the underlying thyroid. It was then readily ascertained that the growth occupied this portion of the interior of the larynx, being moulded to the shape of, but not involving the interior surface of the corresponding wing of the thyroid. Both wings of the cartilage being cleared, the soft parts behind and to the sides of the cricoid, including the articulation of the latter

[1] New York Medical Journal, vol. xlv. pp. 682, 683, 1887. Transactions American Laryngological Association, 1887, New York, 1888, ix. 38–40.

with the inferior cornuæ of the thyroid and its connection with the œsophagus, were separated; the attachments of the inferior constrictor muscles of the pharynx to the posterior portion of the thyroid cartilage were not interfered with. The arytenoid cartilages were included in the parts thus dissected. Upon reaching the line of the attachment of the œsophagus to the cricoid posteriorly, the former was opened in the median line, and through the opening thus formed the index finger of the operator's left hand was passed into the pharynx up to the base of the tongue and hooked over the epiglottis. The latter, together with the entire respiratory contingent, was now forcibly drawn downward, so as to identify the attachments of the thyro-hyoid membrane. The latter was now incised, and the epiglottis detached from the aryteno-epiglottidean folds, when a few touches of the knife served to release the whole mass from its remaining attachments.

It was found that the entire diseased mass had come away completely. After ligating a few bleeding points, the stump of the trachea was repacked with dry gauze, and an œsophageal tube was passed about eight inches down the œsophagus, and the parts above and below the section of the gullet, as well as the neighborhood of the feeding tube, as it passed into the latter, were well packed with oxide of zinc gauze; the latter reached well up into the pharynx above the base of the tongue. A large safety-pin was passed crosswise through the œsophageal tube to prevent the latter from slipping into the stomach.

The patient left the table, fully conscious, within a minute after the completion of the dressings and without the slightest symptom of shock, although the anæsthesia by nitrous oxide had been maintained steadily and without the least difficulty for an hour and forty minutes by Dr. Brush. Indeed, had she been allowed to, she would have walked to her room from the operating theatre.

On the following day the dressings were removed and a small Barnes' rubber bag was introduced into the stump of the trachea, distended, and gauze packed down upon it. The wound was repacked and the gauze packing was not allowed to rise in the pharynx above the level of the wound. It was soon found, however, that the simple gauze dressing was equally efficient, and tolerated better than the rubber bag, and the latter was abandoned for the former. The thyroid wings had been somewhat separated, during the operation, from the muscular structures passing upon either side of their outer walls; their divided edges were brought as near in coaptation as possible.

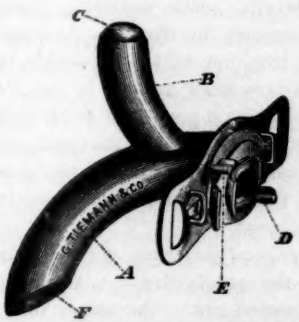
On the second day after the operation, the œsophageal tube was removed, to be again introduced, for purposes of alimentation, at the time of the dressing; but even this caused considerable pain, and finally the tube was left in position eight hours, during which time several feedings were accomplished, the tube being then removed, and the parts remaining undisturbed for four hours.

On the eighth day the tracheal tube was removed from the tracheotomy wound and inserted into the stump of the trachea. About one-eighth of an inch of the edge of each thyroid wing was now found to be somewhat discolored and showed a tendency to curl toward the median line and away from the lateral riband muscles of the laryngeal region. They were accordingly trimmed off with a pair of curved scissors. The entire cavity left by the removal of the larynx contracted with marvellous rapidity, and its walls were found to be covered by

healthy granulations. The upper end of the œsophagus had become very œdematous, and this, when the tracheal tube was removed, served the purpose of an epiglottis in preventing secretions from the pharynx, which found their way down behind the base of the tongue and into the upper portion of the wound, from entering the larynx. Up to this time the patient's diet had consisted of from four to six ounces of peptonized milk, every two hours, and two ounces of whiskey every four hours, with a teaspoonful of beef-juice. On the tenth day following the operation, the patient was allowed to attempt to swallow general fluid diet, such as egg-nog, beef tea, and cocoa.

On the seventeenth day the contraction of the muscular parts upon either side of the remains of the thyroid cartilages had brought the edges of the latter so closely in contact as to render it impossible to pack gauze in that portion of the cavity represented by the parts lying between the wings of the thyroid. The tracheotomy wound had been entirely closed for several days, and the œdema of the œsophagus disappeared. The irritation of a drop of secretion into the stump of the œsophagus caused efforts at swallowing, which act seemed to be perfectly normal. There was a painless contraction of the pharyngeal muscles, which, when it occurred, forced the secretions of the mouth through the wound and out upon the neck.

FIG. 3.



A modified Gussenbauer's artificial larynx. *A*, tracheal canula; *B*, pharyngeal or "chimney" tube; *C*, obdurator, in position as in eating; *D*, button for securing ring attached by a wire to obdurator; *E*, button for securely holding the chimney tube attached to the tracheal portion of the apparatus. At *F* is shown the lower extremity of the tracheal tube cut off somewhat at an angle.

On the twenty-fourth day after the operation the œsophageal tube was removed from the wound, and thereafter at each time of feeding it was passed through the mouth. The packing of the wound was discontinued and a compress of gauze placed in position over the latter, in order to absorb the secretions from the mouth, which were still discharged through the wound. On the forty-first day a modification of the artificial larynx of Gussenbauer was placed in position.

This modification consists, first, of substituting aluminium for hard rubber or silver as the material from which the apparatus is made; second, in dispensing with the cumbersome projecting ring collar—

which, besides being in the way of the patient's dress collar, is exceedingly awkward to detach and replace by the patient—and replacing it with the flat plate and retaining button of the ordinary silver tracheotomy canula (Fig. 3). With the aid of a little pocket mirror, the patient readily adjusts the different parts of the artificial larynx herself.

The patient can now make herself heard in speaking better than before the operation. On New Year's day, forty-four days after the operation, the patient partook of a hearty meal, principally solid food. On January 29th complete cicatrization having taken place, the patient was discharged cured. On May 25th the patient presented herself at my office prior to her departure for her home in the country. She is able to speak in a loud whisper, although no artificial vocal cords or reeds have as yet been supplied to the artificial larynx which she wears. At the date of writing (August, 1889), there is no evidence of a return of the disease, and the patient expresses herself as being perfectly comfortable and in good health.

Attention has already been called by Prof. Solis-Cohen to the great infrequency with which the thyroid cartilages become invaded with carcinoma or other diseases for which complete or partial laryngectomy is performed. This fact led him to consider both the desirability as well as practicability of modifying the operation in such a manner as to retain this portion of the larynx, while removing those portions already invaded, or liable to invasion, by disease. As a result of this study he advanced the opinion that, not only is it possible to lessen the dangers of the operative procedure itself, as well as the difficulties of the subsequent treatment by leaving a portion of the thyroid cartilages *in situ*, but that, theoretically at least, where the preservation of the attachments of the inferior constrictor muscles of the pharynx to these structures are considered, the functional result may be improved by the operation which he proposed.

So far as the knowledge of the writer goes, the case herewith reported is the first in which this proposition, *i. e.*, the retention of the thyroid cartilages, has been carried out. The result fully justifies the views held by Prof. Cohen concerning the operation itself and the improved functional result. The comparatively small gap left by the incision and removal of the diseased parts, and consequently lessened traumatism inflicted, the readiness with which the parts filled up by the reparative process and the firm support afforded for the artificial larynx, together with the great advantages gained by preserving comparatively unimpaired at least one of the pairs of the muscles of deglutition, will, it is believed, lead to the adoption of this method of operation, to the exclusion of all others, in cases in which laryngectomy is at all applicable.

The growth in this case, upon examination by the hospital pathologist, Dr. Eugene Hodenpyle, proved to be a typical epithelioma.

So far as I know, this is the first attempt that has been made to make an artificial larynx from aluminium. The exceeding lightness of this metal,

as compared with either of the materials heretofore employed (silver or vulcanized rubber) commends it at once to the practical surgeon. Again, the decomposition of the silver by the secretions of the parts, and the consequent formation of soluble argentum compounds, which, as has been claimed, are not without deleterious effects when absorbed into the system, are not to be lost sight of.

At *F* (Fig. 3) is shown the end of the tracheal canula cut off at somewhat of an angle; the effect of this is to increase slightly the capacity of the opening at the point at which the air enters the canula, as well as to prevent the anterior edge of this opening from impinging against the wall of the trachea.

A CASE OF EXSECTION OF THE ENTIRE ULNA, WITH RESECTION OF THE HUMERUS AND RADIUS.[1]

By John G. Jay, M.D.,
Professor of Anatomy and Operative Surgery in the Woman's Medical College of Baltimore.

The removal of bones in part, or totality, may, owing to various morbid conditions and injuries, be necessitated. The indications for these procedures when due to pathological processes, malignant or otherwise, are frequently resident in the short, flat, or mixed bones or in the epiphysial portions of the long. It is comparatively seldom that the disease pervades a long bone in its entirety, and so the complete exsection of a bone of this class together with its periosteum is rarely demanded. So rare, indeed, is this requirement, that in many of the text-books of surgery the subject receives but passing notice. The subperiosteal removal of a greater part of a long bone is not an unusual occurrence; and both Agnew and Gross mention entire exsections by a number of operators. According to these authorities, Carnochan, of New York, exsected the entire ulna in 1853. Muscroft, of Cincinnati, in 1870, and Hutchison, of Brooklyn, in 1873. Several other similar operations have been done. The one by Dr. George Williams, in which the ulna with the lower end of the humerus and the head of the radius were removed, would appear to resemble closely my operation; but as it was done for necrosis, I am inclined to think that this, as well as all of the other *entire* exsections, was to a great extent subperiosteal.

In several other of the more recent works on operative surgery (Jacobson, Stephen Smith, Wyeth, and others) complete exsections of the long bones are mentioned, but only comparatively briefly described. Wyeth shows in a woodcut the result of a subperiosteal exsection of the

[1] Read before the Medical and Chirurgical Faculty of Maryland, Session, April, 1889.

radius in which there is a very considerable deformity, but, nevertheless, a useful member.

The parts upon which exsection of the whole length of the bone, with or without its periosteum, would seem to promise most success are those in which there are companion bones; as in the forearm, or, perhaps, the leg. In such cases, especially in young individuals, and when the neighboring joints continue more or less movable, the remaining bone would probably by compensatory hypertrophy become in time, larger and stronger than normal. Even with one of the *single* long bones, viz., the clavicle, excellent results may be secured after its removal, and if the operation be subperiosteal the redevelopment of bone may render the deformity comparatively slight.

In regard to the utility of such operations and the mobility and usefulness of a member from which the whole length of one of the long bones has been removed, the subperiosteal radial exsection mentioned and illustrated by Wyeth, and the case which I here present, and upon which I operated a short while since, are examples, and, although motion be limited, the result may be an enduring benefit.

CASE.—Mrs. E. S., aged forty years; nativity English; appeared at the surgical clinic of the Woman's Medical College in November, 1887. At this time she was suffering with pain and tenderness along the left ulna, and there was a considerable degree of nodular tumefaction and redness over the lower two-thirds of the bone. The diagnosis of periostitis was not difficult, but whether it was syphilitic, sarcomatous, or tubercular was not quite so readily determined. As she had no history of syphilis, nor any manifestations whatever of this disease in other parts, it was eliminated from the list of probable causes. With regard to sarcoma and tubercle the case was not quite so clear. I was at the time inclined to suspect osteosarcoma, but subsequently came to the conclusion that the trouble was tubercular.

The previous history of the case, as related by the patient herself, is, that about eighteen months prior to that time she was taken with a severe pain in the wrist-joint, and that after two months (the pain continuing) she began to notice enlargement of the wrist, and soon nodular swellings commenced to appear and to advance up the ulnar aspect of the forearm. She was treated by several physicians, but with no greater amelioration of her condition than temporary relief from pain.

When she came under treatment at the out-door clinic, as she was pale, anæmic, and worn by much suffering, she was put upon cod-liver oil, iron, and quinia, with a camphorated ointment of iodine and belladonna for topical application. Anodynes as required. She remained under this treatment for several weeks and her general condition grew somewhat better, but there was little or no improvement of the trouble in the forearm; in fact, this continued to advance up the ulna. Seeing which, I advised amputation and obtained from her a somewhat reluctant promise to go to the hospital for that purpose. After this interview, however, she disappeared; the idea of amputation frightened her away, and I saw no more of her for about a year. In the meantime she went to another dispensary in this city and to several physicians *seriatim*.

This continued for five months; she then went to Philadelphia, and, during a sojourn there of several weeks, she consulted two surgeons, both of whom advised amputation. Returning to this city, for a number of months thereafter she had no treatment whatever, except such anodynes and domestic remedies as she took by non-professional advice. Then, impelled by increasing pain and commencing ulceration at the elbow, she returned to one of the dispensaries where she had formerly been treated.

Her trouble remaining unmitigated, she again made her appearance at the surgical clinic of the Woman's Medical College, on December 26, 1888, stating that she had come back for me to amputate her arm. At this time her general condition was not so good as when I first saw her more than a year before. The local trouble was greatly worse. In addition to increased pain and nodular inflammation along the whole course of the ulna, she had a large ulcer over the olecranon, with much surrounding tumefaction and bogginess. The flexors on the ulnar side were so contracted that the fourth and fifth fingers lay rigidly flexed and compressed against the palm. She still had limited but painful motion of the middle and index fingers.

On January 15, 1889, she entered the Hospital of the Good Samaritan. My colleaugue, Prof. Winslow, suggested exsection of the ulna, which advice I concluded to follow instead of amputation, as the latter could subsequently be done should the exsection fail of its purpose.

She was operated upon January 21, 1889. Under chloroform narcosis, and after application of the Esmarch bandage, an incision was made over the posterior border of the ulna from the styloid process along the whole length of the bone, passing to the outer side of the ulceration upon the olecranon, encircling this and returning by the inner side to the incision already made. After severing the lower radio-ulnar ligaments, this end of the bone was elevated and the interosseous membrane divided from below upward. The attachments of the triceps extensor and brachialis anticus muscles were then severed as well as the ligaments, capsule, and other soft parts; the joints disarticulated, and the bone removed.

Owing to the large ulcer over the olecranon, with a surrounding inflammatory area, necessitating the removal of contiguous tissues with the loss of an extensive skin surface, the lower end of the humerus was left with a deficient covering. Accordingly, the next step was to resect the end of this bone above the condyles. The incision was continued upward for two and a half inches on the posterior aspect of the humerus, and this after being denuded was sawed through obliquely. Section of the head of the radius was then made so as to fit the bones together at a right angle. They were drilled and united in this position by two stout sutures of silver.

Up to this time the operation was bloodless, but after removal of the Esmarch there was profuse and troublesome bleeding until the numerously divided vessels could be secured and ligated with catgut. Two rubber drainage-tubes, meeting in the middle and passing through the whole length of the incision, were inserted, one protruding at the wrist, the other at the elbow. The wound was closed by about two dozen sutures, five of them deep buttoned. The operation throughout was aseptic; the arm was enveloped in antiseptic dressing and supported by an anterior rectangular felt splint.

Owing to the spanæmic condition of the patient and the large loss of blood, she barely escaped collapse in the latter part of the operation. Hypodermatic injections of brandy were liberally given, she was put to bed and artificial heat applied. She reacted better than I expected, and several hours afterward was in a quite comfortable condition.

There was comparatively little pain after the operation, and the following morning she expressed herself as feeling more comfort than for many previous months. The temperature in the forenoon after the operation was 99.5°; in the evening it had risen to 101°. On the second day the temperature did not reach 100°. On the evening of the third day the thermometer registered 100.8°. On the fourth day the temperature in the morning was normal. On the fifth day, January 25th, the drainage-tubes, from which there had been very little discharge, were removed, as also several superficial sutures, and the dressing renewed. On February 2d, all the remaining sutures were removed and the wound was healed, except where the drainage-tubes had been inserted. At the next dressing, a few days subsequently, these points were also found closed.

The patient remained in the hospital until February 21st, just four weeks after the operation. During this period her general health improved, and, at the time of her discharge, she had gained a better color and considerable flesh. Much œdema of the hand and forearm continued for a while, which was probably due to the interruption of the circulation by the extensive section and ligature of vessels which the operation necessitated. This has now nearly disappeared.

Although the resected humerus and radius were wired together, complete anchylosis did not take place, and the elbow remains movable to the extent of several degrees. She has regained considerable use of the thumb and two fingers which are left to her. She can already, without assistance, bring the hand to her mouth, hold an apple between the thumb and two fingers while she pares it, and in many other ways make the member useful and subservient to her comfort; and the value of the member seems to increase, so that with a prothetic apparatus for sustaining the parts there is a prospect of even greater usefulness.

In this case the morbid processes existed more in the periosteum and surrounding soft tissues than in the bone itself. The bone was somewhat enlarged, irregular, and roughened upon the surface. The periosteum was thickened and inflamed to such an extent that it was not considered safe to allow any of it to remain, the incision being made well away from it into the surrounding healthy tissues. The result of the operation, I think, justifies the conservatism followed, as it leaves the patient with a more efficient member than any artificial apparatus that could be devised.

REVIEWS.

DIPHTHERIA: ITS NATURE AND TREATMENT. By C. E. BILLINGTON, M.D. And INTUBATION IN CROUP AND OTHER ACUTE AND CHRONIC FORMS OF STENOSIS OF THE LARYNX. By JOSEPH O'DWYER, M.D. 8vo., pp. 326. New York: Wm. Wood & Co., 1889.

THE perennial importance of the subject-matter of this book will warrant a more extended review than its merits would alone call for. It is, however, a meritorious book, and Dr. Billington is to be commended for the industry he has exhibited in the collection of facts from literature and from personal observation, upon which to base his exposition of the nature and treatment of diphtheria. While we miss the critical faculty which gives to such collations their greatest value, the results of the author's own experience are worthy of the attentive consideration due to the conclusions formed by a careful observer whose opportunities have been exceptionally large, and have included the most widely varying conditions, meteorological and epidemiological. It must nevertheless be remembered that the environment and previous history of dispensary patients, especially in the tenement districts of New York City, differ so much from the conditions encountered in private practice, that considerable reserve must be made in the application of results thus gained to the management of cases in the hands of the family physician. Drugs have a much larger value, a partly fictitious value, in those constantly exposed to the unsanitary environment of the greater number of Dr. Billington's patients.

The dose of iron, which to the well-nourished child untoughened by a constant struggle with the elements of disease, is but a slight addition to resisting powers, becomes a wonderful weapon of defence for the tenement-born and alley-bred child, that has managed to survive "two summers." So, is it too, as regards the extra-medicinal treatment; the nourishment, the alcoholic stimulation, the greater or less improvement in ventilation, or protection from deleterious exposure. With the dispensary patient, these amount almost to complete revolution in environment, and thus count for much more in the battle with disease.

Bearing in mind this important distinction, we can study the treatise before us with the expectation of deriving therefrom a useful addition to our knowledge.

The chapters are respectively devoted to "Definition and History," "Etiology," "Pathology," "Symptoms," "The Primary Nature of Diphtheria," "Secondary Diphtheria," "Diphtheritic Paralysis," "Diagnosis," "Prognosis," "Prophylaxis," and "Treatment," with an appendix on "Etiology." The distinctive characteristics are the author's views upon etiology and treatment, and we will confine our remarks chiefly to these subjects.

Diphtheria is defined as

"a specific disease which occurs sporadically, endemically, and epidemically, and is contagious and infectious, its essential characteristics being an inflammation of mucous membranes or of the surface of wounds and the adjoining integument, which tends by cellular proliferation and degeneration and by fibrinous exudation to the formation of a false membrane, and also to the production of a poison which, when absorbed into the circulation, causes morbid changes in the blood and in various organs of the body."

For the production of the disease a specific poison and favoring conditions must coöperate. Age, previous disease producing inflammation, erosion or ulceration of the mucous membrane of the outer air-passages, special family and individual predisposition, cold and dampness—the latter, however, chiefly through their tendency to excite catarrhal inflammations which may afford a suitable nidus for the specific poison—are among the principal favoring conditions. While it is admitted that diphtheria may occur independently of those conditions of filth, bad drainage, overcrowding, absence of ventilation, etc., to which much of its prevalence in the tenement districts of New York is attributed, yet the close connection between such unsanitatry surroundings and outbreaks of this disease, is more than a coincidence. They constitute the most potent factors in its endemic prevalence, and the marked decrease in its mortality since 1875 is, at least in part, due to the removal of some of these evils through the efforts of the board of health.

Insanitary conditions may favor the occurrence of diphtheria by producing diseases which predispose to the reception of the special poison, by the endemic perpetuation and reproduction of that poison, or possibly by its generation *de novo*.

While admitting the possibility or even the strong probability of "mixed infection," the author seems most inclined to accept the results of Roux and Yersin; namely, that the bacillus of Klebs and Loefler is the causative agent, and that it acts by means of a chemical poison which it produces, this poison being of the nature of an enzyme rather than that of an alkaloid.

After full discussion of the evidence, Dr. Billington summarizes his own conclusions somewhat as follows: Diphtheria is caused by a parasite whose growth and multiplication outside of the body are favored by dampness and insanitary conditions, and which is reproduced in the disease. Its presence on mucous membranes is sometimes innocuous. Its vital activity is greatly increased under the conditions which prevail during an epidemic. Its pathogenetic action is greatly favored by preexisting morbid conditions of the body, and especially those involving lesions of the epithelium. This parasite being implanted upon a mucous membrane or a wounded surface, produces a chemical poison, which in turn gives rise to the local diphtheritic process by direct action on tissues and vessels; and this ptomaine being reproduced and more and more widely diffused, is absorbed, and thus causes constitutional manifestations. This morbid process is often followed by invasion of other pathogenetic bacteria, to which various complications are due. No bacterium thus far discovered in connection with diphtheria can furnish a reliable diagnostic criterion.

The important point in this theory is that it looks upon the disease as of strictly local origin; a ptomaine produced by a specific bacterium which has obtained lodgement usually upon an inflamed or abraded sur-

face, causing first by chemical action the local diphtheria; the systemic toxæmia following.

In further support of the view of primarily local origin, to which a chapter is devoted, the author adduces the clinical history, alleging that a frequent source of error is the confounding of the symptomatic fever and nervous disturbances common to the onset of many inflammatory affections, with the evidences of constitutional infection or blood-poisoning which occur later in the disease and are of a different character; namely, pallor, depression, somnolence, etc. Only to this latter group of symptoms, he argues, may we apply the term "constitutional diphtheria," understanding thereby a systemic disease due to the absorption into the blood of morbid products of the diphtheritic process. The earlier group of symptoms is devoid of specific character. Another source of error is the absence of complaint of pain or local soreness, in some cases exhibiting constitutional symptoms, and in which pseudo-membranous exudation exists but is not looked for. "The more strictly the physician observes the rule to examine the throat of every sick child, the fewer will be the cases in which he will suppose the constitutional symptoms to have preceded the local ones."

That there is much to be said in support of this position none can deny. The discussion is old, and it is still unsettled. While we believe that constitutional poisoning precedes even the so-called "catarrhal stage"—in other words, that there is a distinct period of incubation, however short, and that the disease is diphtheria and nothing else from the very start—we admit that septic infection from the products of local morbid action adds to the gravity of the situation, and we are, therefore, at one with the author and with all teachers of extended experience with this disease in the important therapeutic point that thorough and continuous disinfection of the nose and throat is essential to the proper management of every case.

The question of the identity of croup and diphtheria, or, in other words, the exclusive agency of the diphtheritic poison in exciting all forms of non-traumatic pseudo-membranous laryngitis or tracheitis, is discussed at some length. It is admitted that the discrimination attempted to be based upon differences in the histological characteristics of croupous and diphtheritic inflammation and their resultant products, cannot be sustained; as local anatomical peculiarities, and differences in the degree of inflammation, will account for all the distinctions that have been pointed out. On the other hand, however, we have identical processes and products resulting from various mechanical and chemical irritants, and the testimony of competent and reliable observers to the occurrence clinically, of pseudo-membranous laryngitis in no way traceable to diphtheritic infection, and not giving rise to cases of diphtheria. Further, such cases show a much more close relation with meteorological conditions than do undoubted cases of diphtheria. Another argument for the occurrence of non-diphtheritic croup, is the admitted though rare existence of idiopathic fibrinous bronchitis. On the whole, the author concludes that simple membranous croup does occur, though it is a comparatively rare form of disease; but he suggests that in regions where diphtheria is endemic or epidemic, the liability to intercomplication is so great as to render the distinction practically useless.

With this dictum we cannot agree. Precision in diagnosis is never useless. If we are dealing with a membranous croup of idiopathic origin,

upon which diphtheria has supervened, it is well to know even that, for it may influence both prognosis and treatment; while a certainty that we are not dealing with diphtheria but with a morbid process having but a superficial resemblance to it in one respect, will undoubtedly much influence treatment. Remembering that the term "croup" simply indicates that a false membrane is present in the air tube; that this product is the peculiar response of mucous membranes to irritation; that it may be caused by various agents, and thus cannot be in itself specific or pathognomonic; and that, therefore, causation as well as clinical phenomena must be investigated; the discrimination should always be attempted and can usually be made. Of clinical discriminative phenomena, broadly speaking, the most significant are those which in simple croup show that we are dealing with a sthenic inflammation, dangerous chiefly in that its product may mechanically cause death by suffocation; and on the other hand, those symptoms of toxæmia in the croup of diphtheria, which show us to be dealing with a septic process that adds to the danger of suffocation, that of death by paralysis or exhaustion of vital mechanisms.

Symptomatology is discussed at length, in accordance with the type and localization. The author distinguishes a "catarrhal stage," differing in no respect from the initial stage of other forms of sore-throat; a stage of pseudo-membranous formation, and a terminal stage. Gangrene is rare, but it does occur in a small proportion of cases in which the inflammation is intense and the infiltration deep. Its occurrence appears to bear no relation to the gravity of the case in other respects, and some cases in which there has been considerable gangrenous destruction of tissue recover. The term malignant diphtheria should not be indiscriminately applied to all cases in which constitutional poisoning is marked, but should be reserved, as in scarlatina, "for that class of cases which are characterized by exceptional earliness and intensity in the systemic poisoning and by such rapidity in the course of the disease that the distinctive features of its several stages are confused together and unrecognizable." There are two forms of this malignant diphtheria—the violent, "which differs from a form of severe diphtheria . . . only as the tornado differs from the ordinary storm;" and the insidious, which has but a moderate degree of febrile disturbance, and in which the false membrane is of limited extent; though marked pallor, depression, and somnolence indicate from the first, overwhelming poisoning, and death occurs from the third to the seventh day.

In the discussion of diagnosis, the occurrence of herpetic, septic, and other forms of non-diphtheritic membranous sore-throat as described by Da Costa, J. Solis-Cohen, Mackenzie and others, is distinctly recognized; and the discrimination from lacunal tonsillitis is set forth at length. Infectious catarrhal tonsillitis (spreading quinsy) is likewise recognized as a distinct affection. The diagnostic points upon which the author chiefly relies, are two: First, the localization of the membraniform patches in lacunal tonsillitis, that is, in relation to the orifices of the crypts, and therefore chiefly on the more central portion of the convexity of the gland; while true diphtheritic membrane when limited to the tonsil, usually occupies a more lateral or marginal position: Second, in lacunal tonsillitis, syringing the throat with warm salt water will wash away much deceptive matter, showing the friable and superficial character of the membraniform covering, and disclosing its relation to the distended orifices of the lacunæ.

While cases will occasionally be encountered in which a positive diagnosis must be reserved, yet the number in which these methods, combined with accurate observation, will fail, is in the author's experience surprisingly small. He relates a case in which laryngeal stenosis accompanied with exudation upon the tonsils necessitated tracheotomy, yet his opinion that the disease was not diphtheritic was confirmed by the fact that another case in the same house progressed and ended as lacunal tonsillitis. The reviewer has reported a somewhat similar pair of instances, though the larynx did not become involved in the graver of the cases referred to.

Treatment begins with prophylaxis. When there is one case in a family the well children should be sent away if possible; their throats should be inspected twice daily, and tincture of iron, with or without potassium chlorate, may be administered with advantage.

The indications in treatment are, "to destroy, remove, or limit the action of the invading poison; to subdue or limit the inflammation; to obviate occlusion of the air-passages by false membrane; to promote the elimination and counteract the effects of poison which may have been absorbed; to economize and sustain the vital forces in their combat with disease; to avert and combat the morbid effects of the disease upon particular organs and other special dangers which may arise in any case during its course." Successful treatment not only demands a careful adaptation of measures to each particular case, but patient persistency in the use of well-selected ones. Impatience, indecision, and changes without definite reason, are elements of defeat.

Methods of administering remedies are briefly considered. Of local measures, gargling is not available with young children, and with older patients is often fatiguing, unpleasant, and inefficient. Spraying requires coöperation of the patient and is not available with children under three years. Irrigation is therefore to be preferred in most instances. It may be effected with a syringe of piston, fountain, or hand-ball variety. The first is usually preferable. It must be employed with the utmost gentleness consistent with efficiency. Its special applicability is to the nasal passages, and to the throat in cases of children too young to be sprayed. Dr. Billington prefers the half-ounce rubber ear-syringe, with the nozzle padded, or a special instrument with soft-rubber nozzle. The reviewer has been best satisfied with the use of a glass urethral syringe, to the nozzle of which is attached a section of soft-rubber tubing projecting an inch or two beyond the glass tip. This little point of detail is quite important. It facilitates manipulation, and effectually prevents pain or injury. The method of vaporization and inhalation has advantages in some cases; particularly where constitutional as well as local effect of the medicament is desired. Its chief limitation, according to Dr. Billington, is interference with respirability of air; but properly managed, this should not be frequent. Direct topical application by brush, pencil, or cotton wad has the advantage of precision and accurate limitation, and is, therefore, specially adapted for irritating and concentrated substances.

The various agents and methods, topical and constitutional, employed and recommended by divers authorities, are then passed in detailed review. We can refer only to the most important.

Admitting the advantages of caustics in some cases, if used sufficiently early, the counter-indications and dangers are considered so numerous

that they are not to be recommended for general use. Of astringents, Monsel's solution and the tincture of the chloride of iron, either pure or diluted with glycerine, are the most useful. Of solvents of false membrane, lime-water is, for many reasons, highly regarded by the author; though trypsin is a more active solvent, and pepsin is preferred to trypsin. Steam is not deemed advisable in the pharyngeal form of the disease. The reviewer has not observed any particular advantage from the use of solvents, with the exception of hydrogen peroxide; which, indeed, he believes to be the best of all agents for use by irrigation, particularly in nasal diphtheria. It is an efficient antiseptic if used in sufficient strength (about ten volumes) and stimulates tissue-repair and return to normal production of healthy epithelium. Dr. Billington, however, from a limited use of the same agent, of which he speaks under the head of antiseptics, thinks it inferior to many others. Of the various antiseptics, preference is given to the corrosive chloride of mercury, both for local and internal administration. The author, however, considers that if certain limits are passed, mercurials may become dangerous irritant and depressant poisons, and even cause an unfavorable termination. We are inclined to look more favorably than the author upon the early use of calomel. It should be given in sufficient doses and frequency to produce characteristic stools, when it may be substituted by the corrosive chloride in small doses. Gastric or intestinal irritation is a signal for withdrawal of the drug.

Carbolic acid, for local use in proper dilution, is highly spoken of.

While recognizing the dangers of excessive dosage of potassium chlorate, the author uses it freely, locally and internally, usually in a four per cent. solution; and some patients have taken this in teaspoonful doses hourly or half hourly for several weeks continuously. In twenty years' experience, he has not had reason to ascribe to it any injurious effects, and nephritis and albuminuria have been rather infrequent than otherwise. We cannot help considering this an exceptional experience, and would not commend the practice for general imitation. We believe potassium chlorate internally to be one of the least useful of all drugs vaunted in diphtheria; and with Jacobi, think its local use principally beneficial in preventing concurrent stomatitis, which might invite extension of the pseudo-membrane. The use of borax, locally and internally, is referred to. We are acquainted with practitioners in this city who rely upon it almost exclusively and who claim to have very good results. Oil of turpentine is a useful inhalation and may be given internally, according to Baruch, in doses as high as half an ounce in children six to fourteen years of age, once a day or oftener if demanded. The reviewer was taught to keep the air of the sick room impregnated with turpentine by constant evaporation from the surface of warm water in shallow pans, and has had cause to attribute to this measure a favorable influence upon the course of the disease. Delthil's results from inhalation of turpentine and tar vapors, especially in averting the need for tracheotomy, or favoring its successful issue, will be remembered.

Eucalyptus may be used by keeping the patient in an improvised tent and placing the dried leaves in a vessel of boiling water beside the bed. We have been well satisfied with an expedient recommended by Wittauer for pertussis; namely, to keep a sponge saturated with eucalyptol in a bag of cheese cloth which is suspended from a string tied about the neck

of the patient. It has seemed to be particularly useful in averting bronchial complications. Chloride of iron internally is "undoubtedly the most efficient known antidote to the poisonous action of the putrefaction-products of diphtheria in the system at large." It must be given in sufficient doses. In those cases in which a marked tendency to septic poisoning is manifested, the use of the drug should be pushed toward the limit of tolerance; and from one to three ounces daily may succeed where less amounts would fail. Alcohol is useful in assisting to maintain nutrition and averting the tendency to adynamia and heart-failure. The symptom to be especially regarded is the pulse. The quantity given should be large, and may often be heroic. The author advises, however, that it should be reserved for use in those crises in which it is definitely indicated; while in the majority of cases which are early and well treated these indications will not be presented, and its use will therefore be disadvantageous. While agreeing with Dr. Billington that it is not a specific, and should not be used indiscriminately, we think it should be given in moderate dosage from the first in all undoubted cases of diphtheria, unless very mild in type, and pushed unhesitatingly to the point of tolerance as soon as the slightest tendency to adynamia is manifested. In this connection allusion may be made to the advice of Jacobi, not to wait for symptoms of heart-failure, but to prevent that complication by timely use of strychnine, digitalis, or musk.

Following this discussion the author proceeds to recapitulate in connected form the plan of treatment he prefers, and through which he was enabled to report to the New York Academy of Medicine, in 1876, and subsequently, from the dispensary practice of himself and his assistants, some two hundred and fifty-six carefully recorded cases, with a mortality of less than ten per cent. With questions of novelty, originality, or priority, we have no concern. The author lays great stress upon adherence to certain minutiæ, and, in especial, upon certain formulæ for internal medications and local applications. He thus claims to accomplish: "(1) The most efficient possible local disinfection; (2) without irritation; (3) by frequent applications; (4) which are so pleasant as not to arouse the opposition of children nor unnecessarily to annoy or fatigue older patients."

These are unquestionably important elements in successful treatment; and although we do not share the author's belief in the superior efficacy of his particular formulæ, we heartily endorse the opinion that it is necessary to have some definite plan and to follow it persistently.

While there are many agents having the same general properties from which choice may be made; and while we would prefer holding ourself at liberty to make such choice as particular conditions might indicate, it may be admitted that the author's routine choice has shown itself to be good by the results following his practice. Briefly his recommendations are as follows: Having taken the necessary precautions as to isolation, ventilation, etc., if the attack shows a tendency to severity or is attended with marked febrile symptoms, he gives calomel in a single purgative dose of two to ten grains, or preferably in divided doses of one-fourth grain to a grain every half hour, hour, or two hours. Ice, ice-water, water ice, and frequent cool sponging allay fever. If early enough, and age and accessibility render it feasible, abortive treatment is attempted by cleansing the affected spot or spots and then touching with a solution of corrosive sublimate, 1 to 1000 or 1 to 500; a mild antiseptic or solvent spray being used in the intervals. If the affection increases, this pro-

cedure is to be abandoned. As a constant spray, to be used as frequently as possible, importance is attached to the formula of a solution of ten minims of carbolic acid in four ounces of lime-water. If an antipyretic is needed, sodium salicylate is given in doses of from two to fifteen grains in water, hourly or every two hours. If this is not tolerated, antipyrin or antifebrin may be given if urgently called for. He does not use quinine in the early stage. In the majority of cases, he administers from the outset chlorate of potassium and chloride of iron, alternately or in combination. Glycerine and lime-water are the menstrua, and again stress is laid on special formulæ. We thoroughly agree with the high opinion of iron, but would avoid potassium chlorate. Bichloride of mercury may be given in connection with this treatment, and the earlier its use is begun the more likely is it to have good effects—a view we can heartily endorse. Formulæ for combination are given, so that the dose is from $\frac{1}{100}$ grain to $\frac{1}{50}$ grain hourly, in not less than a dessertspoonful of milk or water. Diet should consist of liquids or semisolids, and persistence in the administration of sufficient quantities at intervals of about two hours, is necessary. Where possible, we would employ from the start highly concentrated and predigested foods, both carbonaceous and nitrogenous. The time for spraying, feeding, and giving medicine should be so arranged as to give as long a continuous interval of rest as possible; and we would even prefer lengthening the intervals between medications and applications, except in the very worst cases, so as to give more rest than Dr. Billington's plan permits.

In nasal diphtheria, the cleansing and disinfection of the nasal passages are all-important. Warm salt water (one drachm to the pint) is the solution employed. Some add corrosive sublimate one grain, borax one or two drachms, or salicylic acid four grains. Sodium hyposulphite, boric acid, thymol, and many other agents might have been added to the list, and, as already stated, we prefer to all others hydrogen peroxide. To avoid exhausting the child by useless struggles it is advised that three persons coöperate; one holding the child across her lap, the other steadying its head against her breast, and the third, preferably the physician, making the injection with gentleness, but with sufficient force to remove all pseudo-membrane and secretions. If thoroughly performed, repetition from two to four times in the twenty-four hours will suffice. The indications for alcohol have been referred to; and quinine is employed under the same conditions, in severe cases or in later stages. Among other tonics at this time, digitalis and strong coffee are recommended; and for kidney complications, if threatening, the free use of calomel and dry cupping. The frequent administration of comparatively large doses of iron to combat septicæmic depression is again properly urged.

Medical treatment in reference to laryngeal diphtheria is (1) preventive and (2) mitigating or curative.

Preventive measures are those which tend to check the spread of the primary affection and those which have a special tendency to prevent laryngeal complication, as the inhalation of unirritating antiseptic and astringent sprays or vapors—especially carbolic acid and lime-water—and the internal use of mercurials or terebinthinates.

Among curative measures, the author's favorite spray of lime-water and carbolic acid is again given high rank; and solvents, such as pepsin and trypsin, are recommended. A much-misunderstood point in the effective administration of sprays—namely, that the particles of fluid

must mingle with the inspired air in order to reach the larynx, and that, therefore, the atomizing tube should be at some little distance from the mouth—is clearly stated. The inhalation of steam is recognized as of great value, and the proper method, by means of a tent constructed about the bed or crib, with an opening for ventilation, is described. While the fact is clearly stated that the boiling of lime-water as so frequently practised is useless, sufficient stress is not laid upon the proper method of giving inhalations of steam impregnated with lime; namely, the constant slacking of large pieces of lime in hot water contained in a large vessel, such as a wash-tub or a clothes-kettle. Bichloride of mercury is of special value in this form of diphtheria; and in special conditions non-depressant emetics may be useful, at least as palliatives.

The great mortality of laryngeal diphtheria, when treated solely by medicinal measures, estimated by Mackenzie at ninety per cent., prepares for the discussion of operative measures. Dr. Billington speaks only of tracheotomy, leaving intubation to be discussed by Dr. O'Dwyer. According to the most recent statistics, tracheotomy shows an average success of twenty-eight per cent. In special groups of cases, and with individual operators, a much better showing is made; the best cited by the author being Caselli's record of ninety-five lives saved out of one hundred and fifty cases. The indications, the conditions influencing the result, and the technique of the operation are considered with sufficient detail. We agree with the author that it is better to operate too early than to lose the chance of success by operating too late; though probably the safest course to-day, in a doubtful case, will be to intubate first and if intubation fails to give sufficient relief, then to perform tracheotomy. The author lays great weight upon the suggestion of W. Cheyne for prophylactic tracheotomy, in order to apply disinfectant treatment through the tracheal opening to the mucous membrane of the larynx and trachea with the view of checking extension downward. A different method of accomplishing the same result is Roser's admirable plan of surrounding the tracheal canula with a tampon of antiseptic gauze or muslin, sufficient to close the trachea completely.

Contrary to the author's opinion we prefer the low operation, which, though more difficult, is further removed from the seat of disease; and, as is particularly insisted upon by J. Solis-Cohen, the use of an anæsthetic is to be deprecated, as adding an unnecessary danger in an already desperate case. If the child is properly wrapped in a towel or blanket, a skilful operator should experience no difficulty without anæsthesia that he would not also encounter with it. The author does not insist with sufficient clearness upon the absolute necessity of a thorough search for, and removal of, all detachable false membrane before insertion of the tube; the opening being meanwhile kept patent by forceps, retractor, or special dilator. The advantage of the use of a hollow pilot to facilitate introduction of the tube, as practised by J. Solis-Cohen and the late Krishaber, is a point which, in common with the majority of operators, the author fails to appreciate. While the importance of the after-treatment is in a general way alluded to, and no doubt fully understood by the author, he does not devote sufficient space to it, or give the explicit directions that are necessary. Difficult as is tracheotomy in children, yet competent operators are much more readily found than are surgeons familiar with the minutiæ of the after-treatment in croup and diphtheria. Not alone what to do, but what not to do, should be explicitly stated.

In fact, without a skilled medical attendant to watch the case for at least twenty-four to forty-eight hours, and to prevent intermeddling of officious nurses, the chances for recovery of a tracheotomized patient are very slim. The care of the wound, the care of the canula, the maintenance of a proper atmosphere, the administration of nutriment—by enema, if necessary—the management of the steam or lime inhalations which are still required, and the modifications of medicinal treatment which circumstances may call for, are fully as important as the skilful opening of the windpipe.

Dr. O'Dwyer's article upon intubation is a valuable and timely contribution to medical literature. It is lucid and concise; and without unnecessary verbiage yet gives a full and detailed account of the operation—its philosophy, its indications, its technique, its complications and its incidents, with instructions how to gain its advantages and avoid its disadvantages. Many points of detail are given from the author's rich experience, and from that of others, and we would strongly advise all who intend to resort to this procedure to study carefully the article. As to the position of the operation, that is now assured. The latest statistics from croup and diphtheria show about twenty-eight per cent. of recoveries, the same as for tracheotomy, while individual records are in some cases much better. We are not of those who believe that it can ever fully supersede tracheotomy. As a routine operation it will save more lives, because it will be permitted so much more readily, but we know that there are and always will be cases saved by tracheotomy which intubation could not save. Choice between the two may have to be decided with reference as much to the patient's environment as to his condition. The surgeon should be thoroughly familiar with both operations, and be prepared to do whichever offers the better prospect, all things being considered, in the individual case. The previous performance of intubation will not, except perhaps in the matter of possible delay, render a subsequent tracheotomy any the less successful; and we believe it is, and usually will be performed much earlier than the cutting operation. This is not Dr. O'Dwyer's advice however. He considers the indications for intubation to be the same as for tracheotomy. "There is no reason," he says, "why one should be performed earlier than the other. The beginning of the third or suffocative stage is the time to interfere." And so speak other operators of large experience; and claim that their reports are of cases that formerly were considered to warrant tracheotomy. While there can be no doubt, then, that the experience of intubation represents, on the whole, as distressing cases as does the experience of tracheotomy; we believe, from our own observation with both procedures, and from all that we can learn upon the subject, that the recovered cases include a far less percentage of the more desperate ones. The comparative richness of intubation statistics in the few years that it has been practised, and with the bulk of the practice in the hands of less than a dozen men, is sufficient evidence of this fact. The experience of Wharton, at the Children's Hospital in this city, certainly places a higher value upon tracheotomy as a life-saving operation in the cases of greatest stenosis; and Gay, of the Boston City Hospital, who has had a large experience with both operations, would seem to be of the same opinion in his recent remarks at the Pædiatric Section of the American Medical Association.

This does no detract from Dr. O'Dwyer's great merits in having

patiently and persistently overcome obstacle after obstacle until he had brought to perfection the procedure that will make his name live forever; nor from the very great value of the operation in rendering tracheotomy unnecessary in a large number of cases.

One of the greatest difficulties attending intubation had been the feeding of patients, but this has now been largely overcome by the plan of Casselbery of Chicago, of placing the patient in the inclined position, head downward, and having him drink through a tube. Rectal feeding may also be employed. Opiates, chloral, bromides, or sulfonal, should be employed if necessary to induce sleep; and the practice of hourly or half-hourly medication should not be continued. The child should be permitted to rest as much as possible during the day, and during the night should have at least three hours' uninterrupted sleep.

Intubation in the adult can be best accomplished with the aid of the mirror. It has been successfully practised in all forms of acute and chronic stenosis. While it is deserving of a persistent trial in cases of chronic stricture, in the few cases that have come under our observation it has not been of permanent benefit; resort to the older methods of cutting, progressive divulsion, or gradual dilatation having been necessary after removal of the tube. Further experience is needed to formulate the indications. S. S. C.

LECTURES ON NERVOUS DISEASES. By AMBROSE L. RANNEY, A.M., M.D., Professor of the Anatomy and Physiology of the Nervous System in New York Post-Graduate Medical School and Hospital, etc. Pp. 751. Philadelphia: F. A. Davis, 1888.

THE increase in the literature and importance of nervous diseases has made this an inviting field in which to venture, even if neither knowledge, experience, nor reputation seemed to warrant it; and after looking over the results of Dr. Ranney's short but decided excursion into the realms of the brain and spine, it seems but natural to regret that he has made such an elaborate use of his very limited knowledge of nervous diseases. It is impossible to write a critical review of this book of Dr. Ranney's, it will only be necessary to discuss the subject of "eye-defect" and "eye-strain;" look at the illustrations and the binding, and an unpleasant duty is done.

In his preface, Dr. Ranney calls attention to the fact that the section which treats of "functional" nervous diseases is the most important in the book, and trusts it will "receive the careful attention it deserves." This is the key-note of the book. The subject of "eye-defect" and "eye-strain," developed by Stevens some years ago, is the pivot around which all his investigations turn.

Referring to this method he boldly says in his preface, "no other treatment has ever yielded me such satisfactory results in severe forms of epilepsy, hysteria, chorea, neuralgia, headache, insanity, and functional visceral derangements." To treat these varied and complex diseases by a single method of any kind would seem to be nonsense, but to assert boldly that the correction of errors of refraction, or what is called "graduated tendency of the eye-muscles," will cure this formidable list of

brain, spinal cord, and abdominal diseases, is little less than insanity itself.

Dr. Ranney's claims are too large, and include too many widely different diseases, to demand the serious attention of the profession. He is advising the neurologist to give up the investigation of the nervous system, and to confine himself to the nerve and muscles which have hitherto been the special study of the oculist. Indeed, if the practice he so highly recommends is to be carried out, these two important branches of special practice must be blended into one. The views of Dr. Stevens, which Dr. Ranney so enthusiastically advocates, have not been accepted by the profession, and have been widely criticised and doubted.

In order to show the extent to which Dr. Ranney has pinned his faith to this theory of "eye-strain" and "eye-defect," with the accompanying shadow of "graduated tenotomy," we will quote from page 481, where, under the heading of "Prognosis of Epilepsy," he relates the following remarkable cases:

"One case of insanity recovered his full mental faculties in a few weeks after I performed a tenotomy of his internal recti muscles, and he has shown no tendency to relapses. An epileptic, in whom all convulsive attacks ceased after I performed the same operation upon her, was very deficient in intellect before that step, and is now rather above the average in mental powers. One of the most remarkable cases that ever came under my observation was that of a combination of chorea, epilepsy, and idiocy in a girl about eleven years of age, who completely recovered her health, strength, and mental faculties when a refractive error in the eyes was corrected by glasses, and a serious combination of muscular defects in the orbit was adjusted by tenotomy. This case was one that I saw some three years ago in connection with the practice of Dr. Stevens. At the first examination, the child could not walk without being supported on both sides, drooled constantly, talked unintelligibly, answered questions with apparently little conception of their import, could hardly sit unsupported in a chair on account of chorea, had epileptic seizures repeatedly during the day and night, and presented a most pitiable and apparently hopeless aspect.

"I saw her again, about a year after the operations were performed, at the request of Dr. Stevens. I found her free from chorea and epilepsy, able to run and skip a rope unaided, rosy-cheeked, and in full possession of her mental faculties. Photographs of this case have been already published by Dr. Stevens."

This is but a fair sample of the claims made for the supremacy of the morbid eye over the nervous system, and the controlling effect of what is called "graduated tenotomy" over what were formerly considered the most intractable of nervous diseases. The fact that these theories are so tenaciously held will have a bad effect upon the book as a reliable work on nervous diseases, and it cannot be denied that any one accepting these peculiar views would have a very erroneous idea of the subject.

In every part of the work the same prevailing idea is found. In the section "Electricity in disorders of the sensory nerve tract," page 727, under the heading of "visceral neuralgias," the following remarkable digression will be seen:

"The removal of the exciting cause will, however, greatly assist in making the cure a radical one. I have long taught in my lectures that I had yet to encounter a patient who had suffered for years from migraine who had not some defect in the eyes or its muscles as an exciting cause. Experience leads me still to strongly assert this as my conviction. The same cause is very fre-

quently manifested by paroxysms of spinal pain, peculiarly so at two points, viz., between the scapula and at the junction of the last lumbar vertebræ with the sacrum."

Over one hundred and twenty pages are devoted to the special consideration of electricity in medicine, but one is inevitably brought back to the same point, as the above quotation very conclusively shows.

The illustrations are numerous and old, and in some cases repeated, as on page 163, we find an illustration, colored, from Charcot, of paralysis agitans, to show the gait and attitude of the patient as a factor in diagnosis; and again, the same illustration is used, not colored, on page 589, under the heading of the diagnosis of paralysis agitans.

If an author has an hobby, let him ventilate in the journals, or in a work specially devoted to it, and not undertake an ambitious treatise on nervous diseases, in which from the preface almost to the last pages the burden of the volume is the "eye-strain" and "graduated tenotomy." Frankly, in this case the burden is too heavy, and must seriously affect the work in the estimation of those who are capable of looking at the subject from a conservative and scientific standpoint. J. V. B.

EPITOME OF SURGERY: BEING A COMPLETE COMPENDIUM OF THE SCIENCE AND ART OF SURGERY. By RIDLEY DALE, M.D., M.R.C.S.E.; Member of the Northumberland and Durham Medical Society. 8vo., pp. xii., 498. London: H. K. Lewis, 1889.

THE surgeon who, at the present day, undertakes to supply either student or practitioner with a "complete" compendium of the science and art of surgery is almost unavoidably open to unkind comments from a censorious or hypercritical reviewer. The mass of material to be handled is so vast, and the necessary omissions so numerous, that nothing can be easier than to point out deficiencies. Still, when, in addition to the above sub-title, we read that it was the author's intention to produce a synopsis of the most important points in surgery to serve the student as an aid in preparing for examination, and learn that Dr. Dale has had twelve years' experience in dealing with candidates for surgical diplomas, we not unnaturally expect to find his work brought well up to the present time; especially as he also expresses the hope that it will be of service to the practising surgeon.

In turning over its pages, even while making allowance for the need of condensation, one is struck with the failure to mention many modern methods of treatment, and operations now of almost daily performance. A few illustrations may be taken at random: In treating of the radical cure of hernia, after describing the antiquated and useless methods of Heaton, Wutzer, and Spanton, he devotes more than two pages to Wood's subcutaneous operation, almost equally obsolete, and concludes the article without mentioning the procedures of Macewen, or Barker, or Banks, or any of the others now so frequently employed. The article upon stricture of the urethra contains no allusion to the effects of strictures of large calibre; no mention is made of the relation between the circum-

ference of the flaccid penis and the urethral calibre; no allusion to Otis's dilating urethrotomy; it abounds with such loose statements as "internal urethrotomy is division of the stricture through the urethra," "it is suitable in cases of stricture at the bulb of a gristly nature," etc. In the article on exstrophy of the bladder no mention is made of Roux's operation or of Maury's excellent modification of it. In the article on injury and disease of the spine there is no reference to the use of extension in cases of spinal paralysis, none as to the possible diagnosis and removal of tumors, none to Treves's operation for the removal of carious portions of the lumbar vertebræ. In the description of antiseptic dressings the old method described by Lister and Cheyne is given with all its details, but no mention is made of the fact that surgeons generally, including Sir Joseph Lister himself, have abandoned the spray, that many of them have omitted the macintosh, and that various other important modifications have been made. The possibility of treating wounds without drainage is not alluded to. Arthrectomy and erasion are not even mentioned. In the article on the treatment of syphilis no allusion is made to the fact that many practitioners employ a continuous instead of an intermittent course of mercurials; and in describing the treatment no mention is made of the green iodide of mercury, which is preferred by so many practitioners in all countries. Similar omissions may be found on nearly every page, and in this country, at least, would render the work valueless to the candidate for a diploma. It is noticeable that the methods and teachings of Mr. Berkeley Hill, to whom the book is dedicated, are followed throughout to the exclusion of many other authorities of even greater eminence. The book abounds in quotations, some of them judiciously selected, but many of them out of date and useless. On the whole, it is scarcely to be recommended in its present shape, either to the student or to the practitioner of surgery. J. W. W.

ELECTRICITY IN THE DISEASES OF WOMEN, WITH SPECIAL REFERENCE TO THE APPLICATION OF STRONG CURRENTS. By G. BETTON MASSEY. M.D., Physician to the Nervous Department of Howard Hospital, etc. 12mo., pp. viii., 210. Philadelphia and London: F. A. Davis, 1889.

THE subject of this book is one which, at the present time, is receiving the closest attention at the hands of many intelligent and thoughtful men. It is not a simple subject, for the use of a powerful agent under conditions which may be fraught with serious consequences to the one upon whom it is used, demands more than the superficial knowledge which some writers think sufficient. This book is conservative in its tone, its author is frank and candid, not asserting that electricity can be used for all pelvic disease, and yet expressing a conviction that its field is not a narrow one. The methods of Apostoli are, in the main, endorsed and followed, while it is believed that some of them are susceptible of improvement. The element of personal experience in the book is large, but suitably expressed. The portion which is devoted to the narration of cases is susceptible of condensation, though we admit that a subject of this character allows of rather more than the usual detail, if histories

are to be introduced into the text at all. It covers a wider range of subjects in which pelvic disease is to be treated by electricity than any similar work in English with which we are familiar, and is, on the whole, a very creditable production. A. F. C.

THE DISEASES OF THE CHEST. INCLUDING THE PRINCIPAL AFFECTIONS OF THE PLEURÆ, LUNGS, PERICARDIUM, HEART, AND AORTA. By VINCENT D. HARRIS, M.D. Lond., F.R.C.P., Physician to the Victoria Park Hospital for Diseases of the Chest, etc. 16mo., pp. xi., 419. Philadelphia: P. Blakiston, Son & Co., 1889.

THE author has fully succeeded in the attempt to set forth concisely and clearly "the chief known facts about the diseases of the thoracic viscera." He has produced a book which may safely be put into the hand of the student, without danger of misleading that sorely tried reader into the easy but fatal path of "cram." "Lead us not into temptation" might well be the student's daily prayer to the makers and publishers of the rapidly proliferating "guides" and "compends," which may perhaps give him sufficient pretense of superficial information to enable him to pass the trial of memory miscalled a professional examination, but which leave him helpless and hopeless in the presence of disease. Dr. Harris's book, on the contrary, is a thoughtful and systematic condensation of an important subject, written by one who is evidently thoroughly informed; and it is, therefore, a veritable "Students' Guide." It cannot be mastered by memorizing; it refers throughout to first principles; it is accurate; and within its purposed limits, thorough. Used as the note-book might be, in connection with the more elaborate text-books, and hand-in-hand with actual examination of normal chests and of patients, it will be found highly useful. The discussion of the anatomy and physiology of the chest and its contained viscera, and the exposition of the significance of the various symptoms other than physical signs, which precede the systematic treatment of the etiology, pathology, symptomatology, diagnosis, and treatment of thoracic diseases, are well conceived and clearly written. The views of the author are in general those prevailing at the present day; hence detailed discussion would be out of place in this notice. S. S. C.

LECTURES ON THE ERRORS OF REFRACTION AND THEIR CORRECTION WITH GLASSES. DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL: WITH ILLUSTRATIVE CASES FROM PRACTICE, BOTH PRIVATE AND CLINICAL. By FRANCIS VALK, M.D., Lecturer on Diseases of the Eye, New York Post-Graduate Medical School, etc. 8vo., pp. xii., 241, with 89 illustrations. New York: G. P. Putnam's Sons, 1889.

BESIDES such matter as its title implies, this book contains chapters on the "Anatomy of the Eye and Orbit," "Ophthalmoscopy," and "Muscular

Asthenopia." Many of the illustrations are quite new, and, though roughly drawn, well perform their function; they truly illustrate the text and the subject. The teachings of the work are generally sound and clear. In its perusal, however, one is reminded that a verbatim report of a good lecture makes poor reading, or the repetition of the text of a well-written book a very poor lecture. In teaching by lecture, more of repetition, of varied statement of the same fact, is not only allowable, but necessary. When the words are to be heard but once, the idea must be divided and subdivided into parts, each of which can be clearly set forth in a brief, simple sentence. Where the sentence can be reread, should its meaning not come out clearly on first reading, it is proper to employ a more condensed style, and so effect a saving of the reader's time and effort. Dr. Valk has resorted to a compromise between the lecture style and the book style, but it can hardly be claimed that he has completely overcome the difficulties of the situation. E. J.

RECTAL AND ANAL SURGERY; WITH DESCRIPTION OF THE SECRET METHODS OF THE ITINERANT SPECIALIST. By EDMUND ANDREWS, M.D., LL.D., Professor of Clinical Surgery, Chicago Medical College, and EDWARD WYLLYS ANDREWS, M.D., Professor of Clinical Surgery, Chicago Medical College. Second edition, revised and enlarged. 8vo., pp. xiv., 140. Chicago: W. T. Keener, 1889.

THIS is the second edition of a book the teachings of which are well known, and are, on the whole, sound and reliable. The portion of the book devoted to a description of the secret methods of the itinerant quacks who call themselves "rectal specialists," and who are lineal descendants of the original "pile doctors," is still interesting and applicable to existing conditions, as is also the chapter added in this edition upon the diseases of the "sacculi Horneri" and columns of Morgagni, which have served these charlatans so well for so many years. The large cities of the East, including Philadelphia, could furnish examples of the shameful impostures practised by these persons as striking as any mentioned by the authors. The writers reject on theoretical grounds Whitehead's operation for hemorrhoids, and, for sounder statistical reasons, the operation by injection, retaining a preference for Allingham's operation by ligation, for which excellent detailed directions are given.

A new chapter on the anatomy of the rectum, and another on proctitis, together with a formulary of prescriptions for use in hemorrhoids, proctitis, fissure, rectal ulcers, pruritis ani, etc., add to the value of the work. J. W. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

Milk Sugar as a Diuretic.

Professor Sée has recently presented the result of his study of the diuretic action of milk sugar, which he considers the most reliable of all diuretics. In diseases of the heart and stomach, and also in renal or cardiac affections accompanied by dropsy, its diuretic qualities render it very serviceable. Milk in these cases, as is well known, is of great value, not only on account of its diuretic properties, but also because it is so complete a food. Three or four quarts of milk a day may be used with advantage, but the proportion of sugar in milk is rather too small. Professor Sée has discovered, by experimenting successively with the different constituents of milk, that lactose is the active agent. The action of the other constituents of the milk, such as the water and the salts, is inconsiderable, the chloride of sodium adds nothing, and the salts of potassium very little, to the polyuria induced by the sugar of milk.

This sugar is found in all kinds of milk, is crystalline, and quite soluble in water. About three ounces of it dissolved in two quarts of water, with complete suppression of every other liquid, as soup, tea, wine, mineral water, etc., will afford marked diuresis in all cardiac troubles, no matter what the lesion may be, though the results are less constant in arterio-sclerosis.

In twenty-five cases abundant diuresis resulted; at least eighty ounces of urine were passed, usually one hundred or more, in the twenty-four or forty-eight hours subsequent to beginning the treatment. As soon as the treatment was stopped the amount of urine fell off to what it had been before the administration of the diuretic. Professor Sée, therefore, considers lactose to be, not only the most efficient diuretic, but also the least harmful. If milk is used, and two quarts only are taken, diuresis follows; if four quarts of milk, containing six and one-half ounces of sugar of milk, marked glycosuria is pro-

duced; at the same time there is considerable excretion of urea, indicating a destruction of the albuminates. With the sugar alone these disadvantages may be avoided, for three and a quarter ounces of milk sugar in water will set up a copious diuresis, such as we cannot be sure of having from even four or five quarts of milk.

The polyuria resulting from this treatment surpasses that from all other methods; the amount of urine rises rapidly to two, two and one-half, usually to three or three and one-half quarts, and even to four or four and one-half quarts on the third day. After this it remains at that point, or drops to two and one-half quarts for some days. After a few days the same treatment may be employed to repeat the diuresis.

It is fair to say that this action of lactose may be relied upon in cases of cardiac dropsy, but in those of renal origin its effects are slight. In cardiac disease it never fails unless the kidneys are diseased, and the amount of albumin is considerable. When the amount of albumin is small, the result is favorable, from which it may perhaps be inferred that there is present only a simple venous congestion.

It is suggested that the diuresis may serve as an indication of the condition of the kidneys. Various conditions may affect the diuresis; sometimes diarrhœa occurs, and this diminishes the amount of urine, or the patient may have been subject to profuse sweating, which would also lessen the quantity of urine.

As a rule, the remedy is well borne. It may be prescribed for eight or ten days and then omitted for a few days and again renewed. If the simple solution is not well tolerated, brandy or peppermint may be added to it. All other liquids should be reduced in amount or omitted while this treatment is pursued.

This method presents great advantages over many others, and the patient may partake of any food; a meat diet, if the physician so desire. Professor Sée considers that the physiological action of lactose is upon the kidneys, since it does not exert any influence upon the circulation. He classes it with caffeine, as he believes that caffeine acts upon the kidneys only, and not through the circulation, as do digitalis and strophanthus.

Lactose is regarded as superior to caffeine, as it does not affect the brain and nervous system.—*L'Union Médicale*, June 15, 1889.

Chloramide as an Hypnotic.

At first sight it seems as if we were already provided with a sufficient number of hypnotics, but more careful study reveals the fact that some of them act very slowly, others, though more prompt in their action, have accompaniments which form contraindications. For any special case we are apt to find that the choice is not as large as imagined.

Among many recent hypnotics this one is brought forward with less than the usual flourish of trumpets which heralds the birth of a new drug. From the account given of its use in Professor Strümpell's clinic, in the *Münchener medicinische Wochenschrift*, No. 31, 1889, it may prove to have some qualities not possessed by the other members of this class. Chloramide is an addition-product from chloralanhydride and formamide.

It is a white crystalline body, of somewhat bitter taste; it is decomposed in alkaline solutions, and is, therefore, best given in a slightly acid one. It may be given in wine, as it is readily soluble in alcoholic solutions. It dissolves in nine parts of water. The dose is thirty to forty-five grains, and in Germany this would cost about three cents.

It seems to be best adapted to cases where there is not much pain; in cardiac affections, in neurasthenia, in diseases of the cord, and in phthisis it has proved serviceable. Out of twenty-eight cases it was efficacious in all but two or three. Compared with chloral, it is reported as being the stronger hypnotic; its taste is better and the accompanying symptoms are less. In one case collapse was observed, but it was not certain that it had been brought on by the drug. A slight pain and fulness of the head after waking seem to be the only after-effects.

Thirty grains is a sufficient dose, especially for women; in severe cases, forty-five grains is a suitable amount, given in capsules or in wine.

No unpleasant action on the circulation, respiration, temperature, digestion, or on the secretion of the urine was observed. The experience thus far with chloramide warrants further trial, though, like many other remedies, the disadvantages of its use will be more apparent with a larger experience.

Dr. Reichmann (*Deutsche medicinische Wochenschrift*, No. 31, 1889) began the use of chloramide by giving doses of fifteen grains, and obtained very varying results; with doses of thirty grains the action was better, and with forty-five grains still more satisfactory.

When the drug was administered in the daytime and was not followed by sleep the patients complained of headache. In severe cases the patients felt tired and sleepy after waking in the morning. It does not seem to have a depressing action on the circulation. In short, this observer considers chloramide a very serviceable hypnotic with few drawbacks.

Dr. Erich Peiper has also found chloramide a useful hypnotic. Sleep is induced by it in from a half to one and a half hours, in doses of from thirty to forty-five grains. In many patients it causes headache, dizziness or lassitude on the day following its use. For insomnia, with diseases of the cord, asthma, subacute rheumatism, and diseases of the stomach, where there is no intense pain, it has been found serviceable and is to be preferred to chloralhydrate.—*Deutsche medicinische Wochenschrift*, No. 32, 1889.

Sulphonal.

Dr. S. Garnier has published in the *Annales méd. Psychologiques* a careful study of the use of sulphonal in mental diseases. He considers it the most certain in its action of all the recent hypnotics; in almost all cases the insomnia may be relieved by doses of from thirty to seventy-five grains. It seems to be more reliable than either paraldehyde, urethan, or chloral, and it has the advantage over these drugs of being tasteless. In one hundred cases, vomiting was caused in 5½ per cent., and a slight diarrhœa was observed in 17 per cent.; these symptoms contraindicate the use of the remedy, and when they are accompanied by dizziness and a staggering gait, it should be omitted if congestive symptoms are present.

In cases where the sulphonal was administered only on every other day the patients were relatively quiet during the interval.—*Deutsche medicinische Wochenschrift*, No. 25, 1889.

Administration of Chloral in Eclampsia.

The condition in which the patient is found often precludes the administration of chloral by the ordinary channel. If the woman is in a state of profound coma, she cannot be made to swallow; if the drug is injected in solution into the rectum, it may not be retained long enough to permit absorption to take place. For subcutaneous administration, the drug is too irritating and the dose too large. Other methods have been suggested, among them to pour the solution, through a tube in the nasal passage, into the pharynx; this is very apt to excite coughing, and the solution is promptly rejected.

Dr. Emile Blanc has introduced the chloral by means of a moderate-sized stomach-tube passed through the mouth or nose into the stomach, and recommends this method above others.—*Lyon Médicale*, June 30, 1889.

The Influence of Hypnotics on the Process of Digestion.

Prof. Cramer has made a study of the process of digestion as influenced by some of the hypnotics now commonly employed. Chloral, paraldehyde, hydrate of amylene, and sulphonal, were tested with regard to their influence on the saliva, the gastric juice, and pancreatic secretion. Cramer employed the method of artificial digestion. He found that the diastatic action of mixed saliva is not interfered with by the drugs referred to. The capacity to digest fibrin is not reduced by weak solutions of chloral, paraldehyde, amylene hydrate and sulphonal. In a proportion of one to twenty, all of these, except sulphonal, retard this action. The functions of the pancreatic juice were markedly influenced by chloral and paraldehyde, less so by hydrate of amylene, and not at all by sulphonal.

These drugs should not be indiscriminately dispensed, especially in cases where the digestion is already impaired.—*Medical Record*, August 10, 1889.

Recent Experiments on the Action of Iodoform.

Whether iodoform is a valuable antiseptic or not is a question about which much has been written and many experiments made. On one hand there seems to be a very large clinical experience which leads us to infer that it probably has remarkable antiseptic properties. On the other hand, when tested in the laboratory as a germicide, it has been found to be far behind some other agents. To reconcile these conflicting views is not easy, with the knowledge at our command at present.

That iodoform is unable to render certain bacteria harmless by exposure to it outside of the body, is unquestionably true. Possibly it is capable of thwarting the fatal consequences of certain bacteria when it is applied to the site of inoculation before or soon after the otherwise fatal organisms have been introduced. It is conceivable that the iodoform may act in some way upon the ptomaines which are formed, and thus be serviceable in the wound, though powerless as a germicide.

While iodoform is valueless as against certain microörganisms, its presence is capable of rendering the development of others impossible, though all other conditions are favorable for their growth.

As an agent in the treatment of cold abscesses, iodoform seems to have a

special value. Of fifty-four cases of cold abscess, forty were successfully treated by puncture and subsequent injection of an emulsion of iodoform. Further, the growth of cultures of the bacillus of tuberculosis is inhibited in the presence of iodoform or of its vapor.

Dr. Tilanns's review of the recent investigations on the action of iodoform leads to the conclusion that for the antiseptic treatment of wounds we possess better agents among the soluble antiseptics. Against tuberculous infection, on the other hand, the systematic use of iodoform is more promising than that of any other agent.—*Münchener medicinische Wochenschrift*, Nos. 32 and 33, 1889.

Toxic Action of Cocaine.

Prof. Wölfler points out that the cases in which unpleasant results have followed the injection of cocaine, are chiefly those in which the drug has been employed about the head. It seems that it is more dangerous when injected in proximity to the brain. While one may use ℥xvj of a five per cent. solution in all other parts of the body, for injections about the head the same amount of a two per cent. solution is sufficient.—*Schmidt's Jahrbücher*, No. 7, 1889.

Castor Oil as a Menstruum for Cocaine.

To lessen the irritation caused by a cicatrix rubbing over a corneal ulcer, Dr. S. Mitchell employed a solution of cocaine in castor oil; this relieved the pain and permitted the ulcer to heal after other solutions had been tried in vain.—*Medical Record*, August 3, 1889.

Action of Astringents.

Any series of experiments which will throw light upon the action of such astringents as are most frequently employed, must prove suggestive and useful to the practitioner.

Dr. R. Hfinz has set himself the task of studying the local effects of several useful astringents, in varying degrees of concentration, upon the frog's mesentery.

Dilute solutions of tannin, $\frac{1}{100}$ per cent., cause narrowing of the blood-vessels, which is more marked with stronger solutions; but ½ per cent. to 1 per cent. solutions cause dilatation, after a brief initial contraction; the same holds for still stronger solutions.

Alum, in solutions containing $\frac{1}{30}$ per cent. to ½ per cent., also causes contraction; in a strength of 1 per cent. or over, dilatation of the blood-vessels.

Acetate of lead solutions containing $\frac{1}{100}$ per cent. to 1 per cent., cause a narrowing of the vessels even stronger than that from tannin or alum; more than 1 per cent. causes dilatation.

Sulphate of zinc solutions, $\frac{1}{100}$ per cent. to ½ per cent., cause a prompt narrowing, and 1 per cent. or larger amounts cause contraction.

Sulphate of copper has a similar action.

Sesquichloride of iron, $\frac{1}{20}$ per cent. to 1 per cent., causes a rapid narrow-

ing; 1 per cent. to 2½ per cent. finally induces dilatation. With 2½ per cent. solutions, coagulation takes place in the capillaries.

Nitrate of silver, in solutions containing $\frac{1}{100}$ per cent. to 1 per cent., causes a contraction of the vessels.

Corrosive sublimate in solutions of 0.005 per cent. causes narrowing; 1 per cent. solutions, dilatation, after a previous contraction.

This action of the astringents is a local one.

Their action as styptics is due to their property of precipitating albumin, and thus causing coagulation of the blood. This takes place only by direct contact between the styptic and the blood. The firmest coagula are made by nitrate of silver, sesquichloride of iron, and tannin.

Capillary bleeding may be stopped by a 10 per cent. tannin solution or a 2 per cent. solution of sesquichloride of iron; hemorrhage from small veins by means of a concentrated solution of tannin or an 8 to 10 per cent. solution of the iron salt.

The action of astringents in inflammation is also of interest, since strong solutions stimulate inflammation and weak solutions inhibit it. If an artificial inflammation—that is, one induced by mechanical means—is treated by dilute astringent solutions, the migration of the leucocytes is checked.—*Fortschritte der Medicin*, No. 15, 1889; *Schmidt's Jahrbücher*, No. 7, 1889.

Creolin.

Professor Forster, of Amsterdam, recommends creolin as a disinfecting agent for various domestic purposes, such as the disinfection of floors, furniture, vessels, or clothing.

Solutions containing one-half or one per cent. of creolin are excellent germicides, and stronger solutions may be employed for purposes of disinfection.

The composition of this substance is not yet well understood, but is now the subject of investigation.—*Münchener medicinische Wochenschrift*, No. 26, 1889.

Poisoning by Creolin.

Though creolin is among the safest of the antiseptics, the following case, which will be quoted only briefly, indicates that we are not justified in regarding the use of this antiseptic as wholly free from danger:

A strong, healthy man, thirty years old, took, in the evening, eight ounces of creolin with suicidal intent. He soon became unconscious, and was carried in that state to the hospital. The patient vomited, and the stomach was also washed out. Next morning the patient was conscious, and during the day vomiting was frequent. There was much thirst, but no pain. On the tongue and in the mouth there were no indications of caustic action. The urine had a specific gravity of 1022 and contained a trace of albumin; its color was greenish-black—like carbolic urine. By physical examination the organs were all normal.

On the second day the vomiting ceased, the liver and spleen were enlarged, the urine had a specific gravity of 1037, and contained a quantity of albumin and blood. It gave the reactions for creosol.

On the third and fourth days there was some jaundice, the skin and conjunctiva being slightly colored. The urine on these days was small in amount and of high specific gravity, 1030 and 1038. The patient complained of cramp-like twitchings in the upper extremities, which appeared to be brief clonic contractions.

After this time the condition of the patient improved, the amount of urine increased, its specific gravity was less, and the albumin soon disappeared.

After about two weeks, the patient drew attention to the posterior surface of both forearms, where there was found an area not sensitive to pain, and only slightly to touch. This improved slowly.

In recent years there have been reported two other cases of creolin poisoning, one of them doubtful. Evidently the nervous system and the kidneys are especially liable to the action of this substance, and it is important to submit the urine to a careful examination.—*Berliner klinische Wochenschrift*, August 12, 1889.

Therapeutic Action of Senna Pods.

Dr. A. W. McFarlane directs attention to senna pods, an old remedy, for the relief of constipation. He finds that they have many of the advantages of senna leaves, without some of their inconveniences.

The taste and odor of an infusion of senna leaves are nauseous, its administration is so commonly attended by griping, tenesmus, and flatulence, that it is seldom prescribed except in conjunction with a carminative. The disagreeable symptoms are more marked if the leaves are infused for a long time.

An infusion of the pods, on the other hand, is almost free from taste and smell; certainly it is devoid of the characteristic odor and flavor of senna. It is slower in its action than an infusion of the leaves, but equally certain. An ordinary dose produces without fail one motion, seldom more, of soft consistence, in from eight to ten hours. It is, in short, a reliable evacuant, free from irritating properties, such as cause griping and flatulence.

After a fairly extended experience in its use it has not been disappointing in its utility in any one case; nor has it produced untoward effects.

The dose for an adult is from six to twelve pods; for the young and very aged, from three to six. They are best infused in a claret-glassful of cold water for six or eight hours. A liquid extract has also been prepared.—*Lancet*, July 27, 1889.

Effects of Prolonged Chloroform Anæsthesia.

Some observations made about two years ago by Dr. Ungar pointed to fatty degeneration of the heart and liver as the cause of death after repeated prolonged administration of chloroform. Further experiments on dogs have recently been made by Dr. Strassman, which appear to confirm this view. Dr. Strassman found that the first organ to be affected was the liver, then the heart, and after that other viscera. The nature of the morbid change was not a fatty degeneration, but fatty infiltration. The actual cause of death in fatal cases appeared to be the cardiac affection, as in all such a very marked degree of change was found in the heart. In non-fatal cases the morbid

change was found to have disappeared in a few weeks' time. When morphine was given previously to the chloroform, less of the latter was required, and consequently the changes produced were not so considerable as when the ordinary amount was given. Animals suffering from hunger, loss of blood, etc., were especially predisposed to the morbid changes due to chloroform.—*Lancet*, July 20, 1889.

Sodium Ethylate.

Dr. Arthur Jamison has used the caustic with success in the removal of superfluous hair from the face, in the removal of nævi, and of small vascular areas, seen on the sides of the nose in children, formed by vessels radiating from a common centre.

In the case of a small child, where a large portion of the forehead was covered with superfluous hair, the patient was put under the influence of chloroform, the long hair cut short, and the sodium ethylate rubbed over a portion of the hairy surface with a glass rod. The application was made freely and thoroughly, till the skin had an orange appearance. By the time the child had slept off the effects of the chloroform, the pain of the application had ceased, so that the child was fairly comfortable. A little cold cream was then applied.

At the end of a fortnight the result of this first attempt was seen. The hair follicles over the greater part of where the application had been made seemed destroyed, and a whitish skin remained. Here and there some long hairs remained uninjured. The subsequent progress of the case was slow. It consisted in touching from time to time the hair follicles that had not been destroyed by the previous applications.

This method is recommended in the treatment of hairy moles above any other method of treatment. That by electrolysis is often painful, always tedious, and only applicable for limited hypertrichosis, such as that on the lips or chin. In the case of moles, where we want not only to remove hairs, but also the discoloration of the skin as well, the use of the ethylate has given Jamison better results than the application of any other agent.—*Practitioner*, July and August, 1889.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM OSLER, M.D., F.R.C.P. Lond.,

PHYSICIAN-IN-CHIEF OF JOHNS HOPKINS HOSPITAL, BALTIMORE.

ASSISTED BY

J. P. Crozer Griffith, M.D., ASSISTANT PHYSICIAN TO THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

Walter Mendelson, M.D., OF NEW YORK.

The Therapy of Certain Cases of Pernicious Anæmia.

H. Meyer (*Correspondenzbl. f. Schweiz. Aerzte*, June 1, 1889) reports a case of a woman who, toward the end of her second pregnancy, began to suffer

from nearly persistent pain in the gastric region, fatigue, headache, palpitation of the heart, and a sense of oppression after the slightest exertion. She lost also her appetite, and sometimes vomited and suffered from diarrhœa. Almost every evening she experienced chilliness, alternating with a sensation of heat. Her strength diminished, and a very marked anæmia developed. After delivery the patient did not improve. Evidence of gastro-intestinal derangement continued; dizziness, weakness, and dimness of vision developed, and the anæmia increased and became extreme, though there was no marked emaciation. There was nowhere tenderness on pressure, except in the gastric region. Blowing, systolic murmurs could be heard over the heart and in the vessels of the neck.

Under the conviction that the anæmia was due to disturbances of digestion, the author prescribed Blaud's pills and a nourishing, easily digestible diet. No improvement followed, and the weakness became soon so great that the patient was unable to sit up, and remained the entire day, half sleeping and apathetic, in the same position. There was always some elevation of temperature, with a rapid pulse.

The diagnosis of pernicious anæmia was now made, and seemed to be confirmed by the discovery of retinal hemorrhages in both eyes. The author tried various plans of treatment in vain, and the patient seemed about to die, when he bethought him of a similar case reported by Sandoz in which lavage of the stomach was followed by prompt recovery. He therefore performed the operation, allowing the water to flow until it came back clear. The patient, greatly exhausted, immediately fell asleep, to awake after some hours greatly refreshed and without dizziness, noise in the ears, or headache. The temperature had also fallen to normal. He intended to repeat the operation, but by the next day the condition was so greatly better that it was not necessary. In a few days recovery was complete.

The author emphasizes the fact that the symptoms were exactly those of pernicious anæmia, and claims that a doubt can scarcely be entertained as to the correctness of the diagnosis. The cause was, without doubt, a disturbance of the functions of the stomach. It is scarcely possible that there was present any gastric disorder with important anatomical lesions, since there were no characteristic symptoms of any such, and recovery was too rapid to be accounted for in this way. It is more likely that there were produced on the surface of the gastric mucous membrane abnormal products of fermentation which penetrated into the organism, and, interfering greatly with the nutrition of the tissues, produced the pernicious symptoms. As to the exact nature of these products he makes some suppositions, but leaves the question undecided. The results obtained justify a further trial of this method in similar cases.

Investigations on the Duration of Life of the Typhoid Bacilli in Typhoid Dejections.

Karlinski (*Centralbl. f. Bakteriol.*, B. vi., No. 3) has arrived at conclusions which differ somewhat from those of Uffelmann, published in this Journal some time ago. He endeavored to determine the following points: 1. In what period of the disease can the bacilli be detected in the dejections?

2. Can the discovery of these in the feces be considered a diagnostic sign of the disease? 3. How long are the bacilli of the typhoid stool capable of living? 4. How long can they live in the contents of drains?

His investigations were made on twenty-one well-marked cases. In not one of the twenty-one cases was he able to detect the microbes in the feces before the ninth day after the initial chill. They first appear, namely, at the time when the necrosis of the Peyer's patches begins. At first they are very few in number, but increase continually, and in cases where intestinal hemorrhage shows the high degree of severity which the ulceration has reached they become numerous. From the moment in which the temperature begins to fall, and the stools begin to be more solid, the number of the bacilli rapidly diminishes. In all of the twenty-one cases they had disappeared by the twenty-fourth day, and in some much sooner than this. In only one instance were they still present as late as the fiftieth day, and this fact was clearly due to the occurrence of a relapse. The discovery of the bacilli has some diagnostic value, especially in the case of children and in atypical cases. The author has found in this way that a peculiar endemic febrile disorder occurring extensively in Herzegovina, and which has been described by Pick as an independent disease, is only a very atypical form of typhoid fever.

Further investigations have shown: 1. That the typhoid bacilli will not continue to live in the typhoid stool more than three months. 2. That the keeping of them in different temperatures has no noteworthy effect on the duration of their existence. 3. That the presence in the stools of those rod bacteria which have the power of liquefying gelatine is very injurious to the typhoid bacilli, and causes their entire destruction after ten to sixteen days. The author found that in the absence of these bacteria the typhoid bacilli were capable of great increase in number in the typhoid stool. By the end of two months, however, the number had become small.

Several very interesting experiments are detailed, made in the endeavor to determine the action of the bacilli under the most natural conditions, as in drains and the like. Among the results obtained the author discovered that the foul liquid from privy-wells, sewers, and drains was always of a weakly-acid reaction, and was very fatal to the typhoid bacilli, killing them within forty-eight hours; but he did not determine the relative part borne in this destruction by other microörganisms present, the products of decomposition, and the chemical composition of the foul fluid. He endeavored also to discover how long the typhoid bacilli would live in the solid and alkaline feces taken from a drain, as well as the influence of river water, rain water, urine, garden soil, river mud, and sun on them. The general conclusions upon which he ventures are the two: that the greater quantity of foul sewer-liquid, water, and of putrefactive microbes present, the more rapid is the destruction of the typhoid bacilli which have passed with the dejections into the sewer; and, secondly, that the duration of the life of the typhoid bacilli when mingled with the contents of the sewer is decidedly shorter than Uffelmann's investigations would seem to show.

Œdema of the Brain.

Huguenin (quoted in *Wien. med. Presse*, No. 28, 1889) distinguishes two varieties of œdema of the brain—the inflammatory and the non-inflammatory.

Inflammatory œdema, or diffuse encephalitis, is observed in perforating wounds of the skull with any kind of injuries to, or crushing of, the brain substance; in brain-tumor, as soon as a central necrotic softening takes place in it and approaches the periphery; in abscess; in infectious diseases; and less often in hemorrhages and hemorrhagic infarct.

As regards uninflammatory œdema, opinions have been at variance whether the peculiar arrangement of the circulation within the skull would permit of the exudation of sufficient serous fluid to produce a rapid and fatal pressure on the brain. As the result of his anatomical studies, the author takes the view that disturbances of the circulation in intracranial diseases can produce no fatal œdema as long as the vessels and the conditions within the skull are normal; but that these disturbances, for whose adjustment there are fully satisfactory arrangements under normal conditions, can produce fatal œdema, if previously existing changes are present in the skull or brain. These changes are, obliteration of the ports of exit for the lymph, moderate chronic pressure on the brain through contraction in the size of the skull, or, much more, through arrest of its development, diseases of the brain which produce a greater or lesser degree of pressure. Theoretical considerations would explain the so-called congestive œdema of the brain, *i. e.*, the effusion of serum under the membranes, into the brain and into the ventricles, as being due to a hyperæmia of relaxation, as it is termed, of the vessels of the brain, so that more blood streams through them. At first this occurs with greater rapidity on account of the diminished resistance in smaller arteries; so that instead of the vessels bearing thirty per cent. and the surrounding parts seventy per cent. of the pressure, as in the normal condition, the vessel walls do not bear more than ten per cent., and the surrounding parts receive about ninety per cent. The pressure exerts itself against all distensible parts, such as the fontanelles and the vertebral ligaments, which yield as far as they are able. At the same time there is an increased efflux of the cerebro-spinal liquid through its normal channels, and this may serve to relieve the pressure. If, however, the tension of the bloodvessel walls diminishes, and the pressure of the cerebro-spinal liquid exceeds ninety per cent., this efflux is of no avail. The pressure becomes so great that compression of the capillaries takes place and, thereby, a general obstruction to the circulation, with consequent stagnation of blood in the dilated arteries, and fall of pressure in the veins. The fluid constituents of the blood then leave the vessels, collect in the sub-pial space, brain and ventricles, and the œdema of the brain is established.

This supposition explains the congestive œdema which is said to be common in children, and only rarely to occur in adults. Not in accord with this is the fact that children, unlike adults, have *two* arrangements for compensation—the fontanelles and the ligaments; and still less do those experiments accord, which show that even a very considerable increase of pressure, artificially produced, does not provoke œdema of the brain.

As a result of his studies on his own cases, the author comes to the following conclusions:

1. Those children which were supposed to have died of hyperæmia of the brain, œdema, or slight hydrocephalus, were always found to have had a beginning meningitis, usually of an infectious nature, *i. e.*, a streptococcus-meningitis. What, therefore, the author would formerly have regarded as a

congestive œdema, he would now designate as streptococcus meningitis, more or less developed.

2. On the other hand, fatal œdema of the brain, of a congestive nature, does occur in children, but only under particular circumstances. The first of these is chronic meningitis, which produces obliteration of the channels of exit from the sub-pial space, and obliteration of the Paccionian granulations. In adults, also, chronic meningitis may play a similar *rôle*. The second factor in the production of fatal congestive œdema is present when a pressure on the brain is already in existence, which is, perhaps, already nearly as great as can be endured by the organ. If now any irritation produce a hyperæmia of relaxation, its action will be very rapid, since the brain possesses scarcely any further power to yield to pressure. To this class belong: 1. Fatal cases of œdema of the brain due to lack of power of the organ to expand; this being the result of a too early ossification of the sutures. 2. Fatal cases of œdema of the brain occurring after the intra-cranial space had already been diminished by some disease of the brain. Here belong three categories of affections: acute hemorrhage, tumor and abscess in the inner parts of the brain, which have not yet produced a meningitis; finally, a traumatism of the brain not communicating with the atmosphere.

Pseudo-locomotor Ataxia following Diphtheria.

Morton Prince (*Boston Med. and Surg. Journal*, June 20, 1889) describes two cases of ataxia following diphtheria. In the first there was complete absence of the knee-jerks, slight ataxia of the hands, and moderate ataxia of the legs. The patient swayed abnormally when the eyes were shut. The hands and legs were slightly paretic, with slight anæsthesia of the fingers and feet. There was no change in the eye-ground, and the pupils were normal. There was no atrophy or muscular irritability; no paralysis of the soft palate, bladder, or bowels; no tenderness of muscles or nerves, nor lightning pains. The faradic reaction of the muscles was good. The patient—a physician—had cut his finger two months before while making an autopsy on a diphtheritic patient. The accident was followed by swelling and inflammation of the finger and arm, but no membrane formed in the wound, and no marked constitutional symptoms developed. About ten to fourteen days later he had difficulty in swallowing liquids, which regurgitated through his nose, and two weeks later still the weakness of the hands began. While under the author's care the legs began to improve, but the patient persisted in continuing at his work, and the hands grew worse. Finally he consented to take absolute rest in bed, and at once began to get better, and in the course of somewhat over a month was practically well.

The second case was that of a child of four and a half years, who had had diphtheria followed by a nasal character of the voice. After about eight weeks there suddenly developed paralysis of the soft palate, absence of knee-jerks, and great ataxia of the legs. There was some paresis, but no anæsthesia, and some awkwardness in the use of the left arm; while the head tended to fall forward and could not well be turned to the right; the pupils reacted sluggishly and unequally, and exhibited some rhythmical oscillation in strong daylight. By the eleventh week the boy grew much worse, and

paralysis obscured the ataxia. He then passed from under the author's observation.

Latency of Ataxic Symptoms in Cases of Optic Atrophy.

G. L. Walton (*Boston Med. and Surg. Journal*, August 1, 1889) calls attention to the early occurrence of optic atrophy in locomotor ataxia, and says that in persons in whom there exists this atrophy without recognizable cause, the chances are altogether in favor of the symptoms of tabes developing later. He quotes the statement of Gowers, that optic atrophy so universally appears early in the disease, that, after the ataxic gait is fairly established, it is of rare occurrence. Also the converse statement that, when optic atrophy has become developed, it is common for the other symptoms of locomotor ataxia to remain in abeyance. In a large number of cases the ataxia never comes on, the spinal malady becoming stationary when the nerve suffers.

If this be true, its bearing both on prognosis and diagnosis is of considerable importance. Walton has, therefore, studied the matter from this point of view, and has looked through the records of sixty-six cases of locomotor ataxia in the hope of throwing additional light on the subject. In fourteen of these optic atrophy was present, and in six others there was decided loss of vision, but no description of the optic nerve was given in the notes. The noticeable features among these cases were the large proportion in which the knee-jerk was retained on one or both sides, and the large proportion in which ataxia was either absent or slight. To this absence or indefinite postponement of the ataxia he calls especial attention as confirming the statements of Gowers. As the loss of the knee-jerk usually occurs so early in locomotor ataxia, it was significant that in a number of the cases showing optic atrophy, the knee-jerk was preserved. The constancy of one symptom —the Argyle-Robertson pupil—was noticeable in the cases with optic atrophy, as in those without it. This symptom, together with characteristic pains, may, it seems, be looked for early in these cases, however latent the motor symptoms.

The practical bearing of these facts is to assist us in both diagnosis and prognosis. As regards diagnosis, they lead us to consider with confidence as instances of locomotor ataxia certain cases of optic atrophy which we would otherwise hesitate to place in this category, on account of the presence of knee-jerk and the absence of ataxia. As regards prognosis, they would lead us to predict a comparative latency of the motor symptom of the disease where optic atrophy has become pronounced. The author closes his paper with a detailed account of several cases illustrative of the points which he has made.

Suspension in the Treatment of Locomotor Ataxia.

Edward Waitzfelder (*Medical Record*, June 8, 1889) reports his experience in the treatment of several cases of locomotor ataxia by the method of suspension. The early part of the treatment was carried out by suspending the patients three times a day for three minutes at a time; later the suspensions were only made once every other day, each lasting from one-half to three minutes. The results in all the cases (six) were excellent. In all of

them there had been for years no change at all, or a gradual increase in the severity of the symptoms. All plans of treatment had been followed and abandoned. While under the new method practically no medicine was used. Every one of the patients said he was better than before the treatment, and the author is confident that this was not due to psychic influence. He is convinced that the suspension produced a direct impression on the spinal cord, but does not understand in what way this takes place. It would seem likely that the traction exerted on the spinal nerves in some way brings about a change in the circulation and nutrition of the spinal cord; and that the amelioration of the symptoms is due to the lessening of the vascular supply of the cord and its membranes.

Pneumonia Treated with Peroxide of Hydrogen.

J. L. Greene (*Medical Record*, July 20, 1889) concluded after some study of the action of peroxide of hydrogen, that it might be well employed in the treatment of the "high line," or congestive, and the croupous, or acute lobar pneumonias which are common and very often fatal in the Rocky Mountain region. He has accordingly treated twenty-three cases in this way, and with only one death; this occurring in a puny infant, too far gone when first seen to be saved by any treatment. The main treatment consisted in the internal administration of peroxide of hydrogen; little use being made of antipyretics or opiates. The dose sometimes recommended is far too small, as in the high line form the patient would exhaust the effect of the first dose, and die from apnœa before the second would be due. The author has often given one-fourth to one-half of a teaspoonful, well diluted with water, once in five to ten minutes for an hour or more, with benefit, even when no condition of emergency existed; and he has continued this until after the crisis occurred. Under this treatment he has found the crisis a time of comparatively small importance, and that a case taken early in the stage of engorgement can usually be aborted, and the infiltration removed from the lung.

Phthisis Treated by Inhalations of Hot Air.

G. C. Sears (*Boston Medical and Surgical Journal*, 1889, cxxi. 33) reports the results of his careful trial in four cases of phthisis of the treatment by inhalations of hot air proposed by Weigert. He employed a simple and efficient apparatus which he describes. The sittings lasted at first half an hour, morning and evening, and were gradually increased to an hour. The temperature of the inspired air was at first 160° C., but was soon raised to 200°, and even 220° (428° F.). Salivation and soreness of the mouth occurred in one case, as well as double vision lasting a short time after each sitting during the first few days. The author thinks the following summary justifiable, as far as conclusions can be drawn from so few cases:

1. Cases so treated differed but little in their course from those treated by the older methods. Whatever gain was noticed seemed more justly attributed to the expansion of the lungs from forced inspirations than to the effect of the hot air *per se*.

2. Little influence can be expected from it upon the development of the bacilli. Any germicidal action it may have is largely exerted in sterilizing

the bronchial secretion, and it is to be looked upon rather as a prophylactic measure against the spread of the disease than as curative in any particular case.

3. While it is not proven that the occurrence of hemorrhage in these cases was at all dependent upon the form of treatment, theoretical considerations make it probable that it increases the tendency thereto and suggest caution in its use.

Night-sweats.

Rosenbach recommends the use of an ice-bag for the night-sweats of phthisis. The ice-bag is applied over the abdomen for several hours during the night. This treatment is said to be successful even in cases where atropine and salicyl are not serviceable, and its continued use is well borne by the patients.— *Wiener klinische Wochenschrift*, June 27, 1889.

A New Method for Determining the Acidity of the Gastric Juice.

Although many methods for the determination of the degree and nature of the acidity of the gastric juice have been advanced in the past few years, most of them have, on extended trial, been found lacking in certain important respects. Thus, while nearly all are good tests for hydrochloric acid when alone, many have the disadvantage of having their delicacy interfered with by the presence in the fluid to be tested of certain bodies, such as the peptones, ammonium salts, chlorides, etc., which seriously impair their usefulness for the general practitioner. Leo, after considering the disadvantages of most of the tests at present employed (*Centralblatt f. d. med. Wissenschaft*, No. 26, 1889), proposes a new method, which, from its simplicity, promises to be of much use. The principle on which the test is based is the following: If to a solution of acid phosphates (this turns litmus paper red) calcium carbonate be added, no reaction takes place, and the litmus paper will remain unchanged. But if the solution contain in addition some free acid, the litmus paper will, after the addition of the calcium carbonate, no longer be turned as red as it was on the first trial, owing to the neutralization of the free acid by the lime salt. The application of this principle is as follows: A slip of blue litmus paper is moistened with a drop of the gastric contents and kept for a comparison of color. A few drops of the contents are then placed in a watch-glass, a small quantity of powdered calcium carbonate added, and the reaction to litmus paper tested again and compared with the original. If the litmus paper is now no longer reddened, then the original acidity was due wholly to free acids. If the resulting redness is less than before, it was due in part to free acids and in part to acid salts. If there is no change, the original acidity was due wholly to acid salts.

If the gastric contents be previously extracted with ether to remove lactic and the fatty acids, and if then a free acid be found, it may be set down as being hydrochloric.

This test has given good results in the hands of its originator, and is well worthy of a trial. It can also be used quantitatively, for which see the original article.

Gastric Digestion in Chronic Affections of the Respiratory Apparatus.

Chelmonski (*Rev. de Méd.*, No. 7, 1889) has occupied himself with the question of the nature of the gastric secretion in phthisis, emphysema, and chronic bronchitis, examining such cases as were under his care, without reference to whether or not evidences of gastric derangement were present, but excluding cases exhibiting fever, since, as is well known, fever of itself alters the condition of the gastric secretion. Considerable difficulty was found in obtaining the secretion, the operation often producing alarming dyspnœa, or causing hæmoptysis. The method followed was usually that of Riegel, the gastric contents being removed at from three and a half to five hours after the meal. In some cases the operation was done one and a half hours after the breakfast of Ewald. The test employed was usually that of Günzburg, which the author considers the most delicate. In some instances other tests were also applied.

The author sums up his conclusions as follows:

1. In the course of chronic phthisis, and independently of the fever, there is often found an absence of free hydrochloric acid in the contents of the stomach, and a very small amount of pepsin. This composition of the gastric juice probably depends in part on anæmia of the stomach, due to the general cachexia and to a chronic fibrous endarteritis; and in part on a passive hyperæmia of the stomach, or rarely on an amyloid degeneration of the mucous membrane and of the arteries.

2. In emphysema of the lungs the contents of the stomach are often without free hydrochloric acid, and contain only a small quantity of pepsin. It would seem that this condition is intimately connected with stasis in the gastric circulation, and for this reason is not constantly present in the same case.

3. The changes which have been described in the composition of the gastric juice have no connection with the symptoms of chronic dyspepsia; it has been proved that when the insufficiency of secretion is due to some local cause the chemical action of the stomach is replaced by that of the pancreas. When, on the other hand, the deficient gastric action is due to a general condition, as in fever, any cachexia, or stasis in the abdominal cavity, it is probable that the action of all the digestive glands is affected as well. It is clear that such a secretory insufficiency must sooner or later react on the general state of the organism. That the nutrition of patients with emphysema remains so good is due to the inconstancy of the secretory insufficiency in this disease.

Calomel as a Diuretic in Hepatic Cirrhosis.

Heinrich Kohn (*Centralbl. f. d. ges. Therap.*, May, 1889) reports a case of this affection, which is of interest as an aid in determining the exact value of calomel as a diuretic. The patient had been treated with various diuretics without notable effect, and eventually needed aspiration, but was unwilling to undergo it. The administration of 0.2 gramme of calomel three times a day was then commenced, guarded by opium, and with the simultaneous employment of a mouth-wash of chlorate of potash. Under this treatment,

continued for three days, there developed great weakness and exhaustion which necessitated its discontinuance. In the meantime, however, there had been a very marked diuresis, and the ascites was almost entirely removed.

Nephritis and Albuminuria in the Typhoid Fever of Children.

Geier (quoted in *Arch. of Pediatrics*, June, 1889; from *Jahrb. f. Kinderh.*) analyzed a series of twenty-five cases in which typhoid fever in children was complicated by typical acute parenchymatous nephritis; his object being to see: 1. Whether there is an influence in typhoid fever which tends to albuminuria. 2. Whether the nervous symptoms are dependent on the fever, and whether a connection can be shown between them and the albuminuria. 3. Whether the treatment in typhoid fever exercises any influence on the albuminuria.

The author's conclusions are as follows:

1. Albuminuria is a very common occurrence in the typhoid fever of childhood. It usually appears in the first or the beginning of the second week. Its duration varies, but it usually lasts one or two weeks.

2. Nephritis occurs in the typhoid fever of childhood just as it does in adults. The more intense conditions of this complication occur rather less frequently in children than in adults. There is no particular renal variety of typhoid fever in children.

3. Infectious diseases, like scarlet fever, in which the kidneys are usually affected, appear to lead in children to the development of nephritis, when they are followed by typhoid fever.

4. Fever, albuminuria, and nervous symptoms in typhoid fever are the result of one and the same cause, namely, the intoxication of the organism with the poison which is developed from the typhoid bacillus.

The Toxicity of the Urine in Pneumonia.

Roger and Gaume (*Rev. de Méd.*, April and May, 1889) contribute a long article on this subject. Referring first to the experiments of different writers, which have shown that the urine of persons in a normal state of health is poisonous to animals when injected into their veins, they report experiments with the urine of eleven cases of pneumonia conducted with the object of determining whether there was any modification of the toxicity in this disease. They sum up the result of their studies as follows:

A person suffering from pneumonia eliminates three to four times less poison than when in a state of health. At the moment of defervescence the urinary toxicity increases suddenly and attains or surpasses the normal rate. The urotoxic discharge characterizes the urinary crisis, and is the only constant phenomenon. It lasts twenty-four or forty-eight hours, and attains its maximum on the day of the thermic crisis, or more rarely on the following day. After the defervescence the urine again becomes very little toxic, descending suddenly or gradually to the normal amount.

Potash plays an important *rôle* in the toxicity of the urine in pneumonia. It is the principal factor during the febrile period, but as its amount increases either not at all or inconsiderably at the time of defervescence, it cannot explain the urotoxic crisis. The physiological analysis shows that the toxicity

of the urine at the moment of the crisis depends on different poisons, little known from a chemical point of view. We are acquainted only with certain toxic alkaloids dependent, perhaps, on the existence of pathogenic agents.

Antipyrine in Diabetes.

In the *Bull. de l'Acad. de Méd.*, 1889, page 503, different observations on the usefulness of antipyrine in the treatment of diabetes are recorded. Upon a daily dose of 30 to 45 grains, and without the observance of a special diet, Panas found great improvement in all symptoms. G. Sée says that a cure, in some cases temporary, in others permanent, is effected by antipyrine in those patients in whom the amount of sugar in the urine does not exceed from 2½ to 3 ounces to the quart. Under its use all the characteristic symptoms disappear, provided that the diet be rich in nitrogenous elements and poor in hydrocarbons, though the latter need not be entirely excluded. No effects can be hoped for in advanced cases, or in those in which the excretion of sugar exceeds the limits just stated.

Robin, on the other hand, considers the drug but suspensory in its action, and warns of the too free use of it. Large doses he found interfered with the appetite and caused albuminuria if persisted in. Patients should never be allowed to use it habitually, and it should at once be stopped with the appearance of the first signs of poisoning.

New Method of Treatment of Water Gas Poisoning.

D. A. Cleaveland (*Boston Medical and Surgical Journal*, cxxi. No. 2, 29) says that there has been an increasing effort on the part of interested parties to introduce plants for the manufacture of this poisonous gas. The symptoms presented by persons affected by the inhalation of water gas do not differ widely from those seen in those individuals deeply unconscious from the effects of other lethal poisons, except that the coma is more persistent and profound, and continues for several hours with no marked change until near the end of life; then a sudden change in the respiration, a rapid failure of the heart's action, a few forcible respiratory movements, and the patient is dead. It is the carbonic oxide contained in it which is its principal poisonous constituent. Water gas is so much more dangerous than coal gas, because it contains an average of 27.46 per cent. of this substance, while coal gas has an average of but 5.53 per cent. It is on this account that there is usually but little difficulty in resuscitating persons poisoned by the ordinary illuminating gas.

In view of the dangerous nature of water gas, and the perils attending its employment, and as all methods hitherto adopted to resuscitate persons deeply under its influence have been useless, the author is induced to report a case in which he employed a new method with success. The patient, when first seen by him, was apparently moribund, in profound coma, with livid face and cold extremities. The pulse would beat 8–10 times with tolerable fulness, and then run down to a mere flutter, and for a moment be entirely lost at the wrist. The respiration corresponded with it in character. There were spasms of one side of the face, and the sound of rattling mucus in the throat. For

six hours previously various artifices had been employed to save her life; including artificial respiration, inhalation of oxygen, hypodermatic injections of ammonia, atropine, etc., but without the least appreciable effect. The author quickly decided to try transfusion; and accomplished this with a Davidson syringe and an aspirator needle, whose end he filed off. He opened the median cephalic vein and bled the patient until the weakness of the heart-beat gave evidence that the limit of safety had been reached. Then inserting the needle and carefully preventing the entrance of air, he injected very slowly about ten ounces of warm fresh milk. Two hours after the operation there was a marked improvement in the appearance of the patient, and four and a half hours after it she swallowed and retained stimulants. In twenty-five days she was able to sit up.

The author was led to employ this anomalous treatment on the ground that the carbonic oxide in the blood had destroyed the red blood cells, so that they could no longer absorb oxygen. It therefore seemed desirable to reduce the amount of carbonic oxide present, and to dilute the remaining portion; milk being a convenient and suitable substance for this purpose.

Signs of the Moribund Condition.

John Shrady (*Medical Record*, June 8, 1889, 626), after dwelling on the expediency of an early recognition of impending dissolution, passes in review the most important death-signs; some antecedent by a considerable time, others occurring not long before the end comes. A very certain sign is the suppression of the catamenia as a diversion in favor of the acknowledged vital functions. This may occur months before the catastrophe arrives. Colliquative diarrhœa with muscular relaxation comes on much later, and is a less important sign, needing corroboration by other signs, such as epistaxis or hemorrhagic alvine discharges, as in typhoid fever, or purpuric spots, as in the malignant forms of the exanthemata. Shrunken retinal arteries and a pallid disk are more important. An abnormal appetite may be noted in the last stages of phthisis, in low fevers, and in cerebral complications. It may be interpreted as an intuitive desire to overcome the sense of extreme exhaustion. Optic delusions, such as picking at the bedclothes, extreme muscular prostration, and subsultus tendinum, are most unfavorable signs, and the dilated, glazed eye, and the relaxed smile are still later signs of the approaching end.

An intermittent pulse is nearly always an alarming symptom, especially when it occurs in the course of a debilitating disease. The writer has in more than one instance, as in cancer and in consumption, known it to be a virtual herald a fortnight before the occurrence of death. In all dubious cases the sphygmograph might prove of great prognostic value. After the intermittent pulse may appear many quite obvious signs, such as an ashy tint of the face, purple-hued nails, the distinctive white lines around the orbicularis oris seen in serious forms of scarlatina, the whispering voice, pleading look, and grunting respiration. All these are signs of a hindered circulation. Subsultus tendinum, hiccough and convulsions, which appear later, are manifestations of the disordered nervous system.

Left unilateral dropsy beginning in the foot is a very valuable sign of the gradually approaching end. Conjoined with this may be noticed a coolness

of the ears, tip of the nose, and malar regions; to be followed, much later, by coldness of the patellar surfaces. These symptoms may come and go for weeks at irregular intervals, but are ominous of evil. The state of the temperature is a matter of importance. A temperature of 105° F., long maintained, renders the prognosis unfavorable with but little qualification. On the other hand, a temperature below 95° is usually quoted as being very serious.

Coma is to be regarded as among the surest signs of approaching death. A rate of respiration thrice the normal, and continuous, also renders an unfavorable prognosis the rule; the only exception, and that a partial one, being in uræmic asthma. Cheyne-Stokes respiration, like uræmic asthma and the exhilaration of uræmic poisoning, may exhibit itself at short intervals.

Of all the signs of dissolution a persistent up-and-down movement of the *pomum Adami*, as temporarily seen in the act of swallowing, is the most valuable. It appears very early in certain forms of the dissolutive state, usually in the period of tracheal râles. In phthisis it may precede the catastrophe even a fortnight or longer. When appearing in diphtheritic croup neither tracheotomy nor intubation is available; this statement having the force of a rule. This sign has been used with success in distinguishing between drunkenness and compression of the brain, being always absent in the former, and present in the moribund condition.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY PHILADELPHIA, AND GERMAN HOSPITALS.

The Antiseptic Treatment of Wounds.

A brief *résumé* is given (*Centralblatt für Chirurg.*, 1889, No. 34) of the wound treatment adopted by von Bergmann, Mikulicz, and H. Schmid, all eminent surgeons and representatives of the advanced thought of Germany.

Von Bergmann requires the patient to be thoroughly cleansed with soap in a warm bath, after which he is brought immediately to the operating-table, shaved, washed with alcohol, or with ether, if necessary; and, finally, the field of operation is washed with bichloride of mercury, 1:500, and surrounded with towels wet in the same solution. The operating-table is covered by a sterilized cloth. Operators and assistants cleanse their hands according to the method pursued in regard to the operative field. Everything which can come in contact with the patient—clothing, scrubbing brush, etc.—is previously sterilized by superheated steam, except the sponges, which are washed in boiled water and soaked in bichloride solution. The instruments are sterilized by carbolic lotion. For ligatures and buried sutures sublimate catgut is used. For superficial sutures, sterilized silk is employed.

Since the air of the ordinary clinic room is rich in pathogenic organisms,

the wound should be carefully protected during operation by sublimate compresses. Absolute hæmostasis is insisted upon, even slight oozing in connective tissue or bone cavities being checked. The wound is then irrigated with 1 : 2000 sublimate solution, dried by means of sterile gauze compresses, drained, closed, and dressed with sterile gauze containing no antiseptic, absorbent cotton, and a moss pillow. These dressings are sterilized by means of heat. If the wound is already infected, it should be opened freely, cleansed, drained and counter-drained, packed loosely with iodoform gauze, and dressed with sterilized gauze and the moss pillow. The superficial dressing is changed, but the packing is not disturbed unless it becomes wet and dripping. In that case it is removed and a drainage tube substituted for it.

After operations which leave the surgeon not quite sure as to the absence of infective matter in the tissues, or in case the bleeding has not been thoroughly checked, or where the wound is in a region difficult to keep germ-free, von Bergmann commends primary iodoform gauze tamponade with secondary suture.

Finally, after resections and arthrectomies performed for the cure of tubercular arthritis, the wound should be treated with ten per cent. iodoform ether, and tamponed with iodoform gauze; the latter to be removed in two days and the wound sutured without providing for drainage.

In contrast to von Bergmann's treatment, MIKULICZ commends, in many cases, Schede's method of obtaining healing (moist blood-clot).

The ordinary chemical antiseptics are used. Sponges are discarded for wads of sublimate cotton wrapped in mull, and kept in sublimate lotion. During the operation the wound is washed out with sublimate solution every five minutes. All bleeding vessels are tied, the wound finally thoroughly irrigated, first with five per cent. carbolic solution, finally with the bichloride of mercury lotion, closed by relaxation sutures of silk or silver and a continuous catgut suture, and dressed with protective or gutta-percha tissue, ten per cent. iodoform gauze wrung out in five per cent. carbolic lotion, and a moss pillow. In two places a little space is allowed between the sutures so that any excess of blood can escape. If there is a cavity left at the operation which cannot be closed by approximation of the wound surfaces, the space for the escape of blood must be left at the highest portion of the superficial incision. The bandage is usually not changed till the wound is entirely healed. After operation upon tubercular inflammations, Mikulicz recommends iodoform gauze, tamponade, and secondary suture. Of the 160 major cases treated by this method, Mikulicz has lost only one. This patient died sixteen days after operation of consumption. In only three cases did pain and high temperature force him prematurely to change the dressing.

SCHMID completely closes his wounds immediately and discards drainage. Should symptoms denoting tension or suppuration appear, he removes the dressing, takes out a stitch, and opens the wound somewhat. The site of operation is covered for twelve hours with moist sublimate compresses, and is finally washed with ether and sublimate solution. In every pause of the operation the wound is covered by sublimate sponges. There is no irrigation and the minimum of sponging. Most careful attention is given to checking the bleeding, after which the wound is flushed with bichloride solution, dried, dusted lightly with iodoform and approximated throughout its whole extent.

A compression sponge is now applied, iodoform, mull, and a moss pillow. The dressing is completed by a pressure bandage very firmly applied, which can be loosened if painful in twenty-four hours. In wounds where pressure is not necessary, salicylated collodion painted over the skin sutures will prove a sufficient dressing. For infected wounds, Schmid advises free opening, drainage, by means of iodoform gauze, and antiseptic poultices.

Trephining in Head Injuries.

To systematize, to some extent, the indications for trephining in case of head injury, Zeidler (*Wien. med. Presse*, No. 25, 1889) draws a sharp distinction between the local injury to the skull, and the secondary effect upon the brain. Since it is clearly proven that a depressed fragment of bone is in itself never sufficient to cause pressure symptoms, and since the cerebral effect produced by such depression is uncertain and transitory, trephining with the object of correcting such depression is never indicated. So far as the brain is concerned, the single indication for primary trephining is where we have pressure symptoms which are clearly due to internal bleeding.

As for the indications given us by the local bone injury, the single question for deliberation is that of infection; replacement is not for a moment to be considered. Hence it primarily follows that subcutaneous fractures, with or without depression, should never be trephined. In compound fractures, however, septic matters have ready access. Here trephining may serve a valuable purpose in enabling us to secure asepsis. It is to be regarded rather as a débridement, is accomplished by the chisel and saw where possible, and has precisely the same object that similar methods would have in compound fractures of other bones; namely, the placing of the wound in the most favorable condition for thorough purification and primary healing. Thus in a compound comminuted fracture of moderate extent all loose splinters are removed, the depressed bone is raised, the sharp edges are rounded, the opening in the skull enlarged, and the whole wound is carefully disinfected; or, in other words, the surgeon makes a careful débridement.

In more extensive fractures, a less active intervention is required. Bergmann's rule is, the more extensive the break, the less imperative is the indication for chiselling, elevation, or extraction of fragments. Fissures, even though accompanied by depression, require only disinfection and antiseptic dressing.

The following cases illustrate these statements.

I.—Child, æt. three years. Bitten by a dog. Five large scalp wounds varying in length from two to four inches. In the right parietal region a punctured comminuted fracture, with the splinters of bone driven inward. Dura not injured. A fracture over the longitudinal sinus with wound of the latter and copious bleeding, not stopped by long-continued pressure. Débridement with tamponade of the sinus. Suture of the wounds. On the sixth day complete healing. Of especial interest is it to note that continued pressure failed to check the bleeding from the sinus, which was not arrested until a tampon of iodoform gauze was thrust into it.

II.—Man, æt. fifty-one years. Comminuted fracture of frontal bone in region of frontal sinus, posterior plate of latter perforated, dura uninjured. Depressed fissured fracture passing upward to frontal protuberance. Dé-

bridement—tamponade. On the second day skin sutures removed on account of suppuration in the wound. Healing under tampon.

This case shows that the attempt at healing *per primam* should not be made in fractures involving the frontal sinus, but that the whole cavity should be packed with iodoform tampons. In a similar case of Wagner's, death from sepsis followed.

The indications for trephining in case of fractures already infected or suppurating, or complicated by meningitis, require careful consideration. If the meningitis is diffuse, operative procedure is, of course, useless; but in case of local encephalo-meningitis the prognosis is by no means absolutely bad. Punctured comminuted fractures, even though suppurating, should at once be subject to most rigorous débridement, and though a successful issue may be rare, its possibility is shown by the following case:

Patient æt. nineteen years. Comminuted punctured fracture of frontal bone. Fragments driven into brain. Entered hospital thirty-six hours after the injury. Incipient meningo-encephalitis evident. Temperature 102.4°. Thorough débridement. Evacuation of a purulent fluid mixed with brain substance. Careful disinfection. Consciousness returned a few hours after operation. Normal temperature from fifth day. Cure rapid and complete.

Wagner has reported two similar cases, and even if they be the rare exception, operation is imperatively demanded, since death is the absolute result of a more conservative policy,

As the result of a careful study of the subject, Zeidler draws the following conclusions:

1. Symptoms of cerebral pressure following head injury indicate trephining only when these symptoms point clearly to bleeding from the arteries of the dura.

2. Simple fractures of the skull, unaccompanied by symptoms of intracranial hemorrhage, never indicate trephining.

3. Depression of the bone in itself should not be considered as an indication for trephining.

4. The object of primary trephining is asepsis, or the checking of hemorrhage.

5. Secondary trephining is indicated in cases of beginning meningo-encephalitis.

6. Epileptoid attacks, due to the pressure of splinters of bone pressing upon the brain, should be relieved by removing these splinters.

7. In treating fractures which involve a sinus, the bleeding from the latter should be checked by tamponade, and not by suture.

8. The term débridement should be applied to the operative procedures necessitated by a complicated fracture of the skull, trephining being reserved for the formal operation upon the uninjured bone.

Resection of the Upper Jaw.

In place of the usual free incision for excision of the upper jaw, Heusner (*Deutsch. med. Woch.*, 1889, No. 8) advises a much smaller wound. Somewhat below the infra-orbital foramen he makes a cut an inch and a half long. By means of a chisel the infra-orbital canal is laid open, and the infra-orbital

nerve and artery are freed. By blunt dissection, carried on partly through the wound, partly through the mouth, the soft parts are freed from the bone. Division of the osseous processes is accomplished by means of the chain-saw.

In case of benign tumors this procedure might prove serviceable, though it should be borne in mind that the scar of the ordinarily extensive incision made in this operation is neither conspicuous nor unsightly.

Epithelioma of the Upper Lip.

Eschweiler (*Deutsch. Zeitschrift für Chirurg.*, Bd. 29, Heft 4) has carefully reviewed the literature bearing upon epithelioma of the upper lip. Heuter declares that this region is entirely exempt; the record of cases, however, proves positively to the contrary.

The rarity of disease in this portion is of decided importance from a bacteriological standpoint, for, epithelioma being a very common affection of the lower lip, were it dependent upon a specific microörganism, and infectious, its spread by surface contact to the upper lip would necessarily be frequently observed.

Bergmann states that the relative frequency of cancer upon the lower and upper lip is as 25½ to 1. In the Bonne clinic this ratio is given as 17 to 1. At Cologne it is rated as 12 to 1.

The lower lip, as is well known, is much more commonly affected in men than in women. Bergmann stating that of a hundred cases ninety-one were men. Of sixty-one cases of this disease in which the upper lip was invaded, twenty-four were women.

The patients generally belonged to the laboring class. The average age was about sixty years. The left side was most frequently affected, next in order came the middle of the lip, and last the right side.

Pipe-smoking is generally regarded as directly causative, but a defect of the skin or want of protection of the epidermis, however produced, should be regarded as the true predisposing factor.

The Treatment of Stenosis of the Pylorus.

Lauenstein (*Deutsch. medicin. Woch.*, June 27, 1889) reports two cases of pyloric obstruction successfully treated by operative means. In one a gastro-intestinal fistula was formed on account of an inoperable pyloric stricture. The patient gained forty-one pounds in the six months following the operation. In the other case the lumen of the pyloric valve was nearly obliterated, but the tumor was freely movable. Pyloric resection was performed, the patient gained thirty-nine pounds in weight, and shortly resumed his work as locksmith.

Only after opening the abdomen can the operator determine the point as to whether operation is advisable, nor can he determine upon any method of operation till he has made his exploratory incision.

There are, nevertheless, certain points which are of great diagnostic value. From the mobility of the tumor, the extent of adhesions and the length of the duodenum can be inferred. If there are no adhesions the pylorus lies to the left when the stomach is empty, but is pushed far to the right when that

viscus is full. This movement does not positively prove the non-existence of adhesions, since it is obvious that attachment of the pylorus to the gall-bladder or transverse colon would not materially restrict motion.

These pyloric tumors are always most readily felt when the stomach is empty.

In regard to symptomatology, it must be remembered that clinically the symptoms of duodenal stricture are identical with those arising from pyloric obstruction. In spite of the high value attributed by many writers to chemical and microscopic tests, we must acknowledge that they have not proven of great service. For instance, free hydrochloric acid is frequently found in connection with gastric cancer, and may be entirely absent in cases of simple ulcer. Cachexia is of very distinct value.

Patients suffering from stenosing ulcers, especially men, aside from emaciation, often exhibit neither cachexia nor anæmia.

Gastroenterostomy, after Wölfler's method, is suited to cases of ulcer or carcinoma where pyloric excision is not possible or is too dangerous. The ideal operation is always resection and pyloroplasty. Loreta's operation is one which Lauenstein characterizes as not popular in Germany.

Radical Cure of Diaphragmatic Hernia.

A case of diaphragmatic hernia treated radically not by means of laparotomy, but through the thoracic cavity, is contributed by Postempski (*Wien. med. Presse*, No 21, 1889). After some previous experiments upon the dead body, the operation was first essayed upon a young man suffering from a traumatic diaphragmatic hernia. There was a penetrating wound of the eleventh intercostal space. This was enlarged until the diaphragmatic opening was exposed. The edges of this opening were seized with pincettes, the prolapsed omentum was reduced, and the rupture was closed by means of sutures. The pneumothorax disappeared in twelve days, and in three weeks convalescence was complete.

Lumbar Hernia.

Since Petit's triangle (a triangular space bounded by the latissimus dorsi, the crest of the ilium, and the external oblique muscle) is wanting in about every fourth man, and is nearly always absent in children, J. Hutchinson, Jr., (*British Medical Journal*, July 13, 1889) holds that the classical teaching in regard to the appearance of hernia in this anatomical region is not correct. In a case observed by himself the protrusion occurred at a point above and within this triangle.

Out of twenty-nine cases collected by Hutchinson, sixteen developed suddenly or were attributed to strain. All of these were in adults or elderly subjects. Practically, the spontaneous form of lumbar hernia is confined to the period of adult life or old age, while that due to abscess or traumatism may occur much earlier.

With regard to diagnosis, the main point is, to bear in mind that a hernia may occur in this region, since, from ignorance of this fact, the intestine has been actually incised.

A well-made abdominal belt will usually be all that is required in the way of treatment, although Owen has performed a successful radical operation upon a patient suffering from this form of hernia.

Splenectomy.

Maccall contributes a case of splenectomy (*British Med. Journal*, July 12, 1889) in which most careful examination both before and after extirpation of the spleen showed nothing abnormal in the constitution of the blood. The patient gave a history of malaria in childhood. The tumor first appeared in the left ovarian region and was about the size of a man's fist. A year later, the woman having meantime given birth to a child, and having been much reduced in health by mammary abscess, the tumor was found in front of the uterus, extending from the pubes to the umbilicus, and measuring fully nine inches transversely. It was slightly movable and evidently not attached to the uterus. The patient was referred to Sir Spencer Wells, who diagnosticated the tumor as an enlarged displaced spleen.

In the course of another month there had been a sudden and rapid enlargement of the tumor, followed by a sharp attack of peritonitis. The marked constitutional symptoms attending the onset of the attack suggested that there had been a hemorrhage confined within the splenic capsule. The peritoneal inflammation subsided, but the enlargement was so great, the dyspnœa, pain, and vomiting so wearing on the patient, that aspiration was advised, and ten pints of a thick, reddish-brown fluid were drawn off. Reaccumulation was exceedingly rapid. On account of this, and because of the patient's failing strength, a formal operation was performed by Sir Spencer Wells. In the course of the operation the cyst-wall was ruptured and about eight pints of fluid, similar to that aspirated, escaped. The solid part of the tumor, consisting of hypertrophied spleen tissue, weighed four pounds.

There were extensive adhesions, so firm in one place that a portion of the cyst-wall was not removed. No drainage-tube was used, the wound being finally closed with silk sutures, which included sac-wall, peritoneum, and integument. The temperature was 100° F. on the day following the operation, subsequently normal. In seven days there was a purulent discharge, very offensive, which escaped with some force and in considerable quantity on removing a stitch. This was subsequently followed by an obstinate and prolonged attack of vomiting, yielding only to rectal alimentation. On the subsidence of this complication recovery was practically uninterrupted.

Examination of the blood on the morning of the operation demonstrated no abnormality. Another examination, made more than a year after the spleen had been removed, showed that to each cubic millimetre there were 4,500,000 red corpuscles and 7000 colorless corpuscles. The hæmoglobinometer gave between 75 and 80 per cent. of hæmoglobin.

Extirpation of the Kidney for Malignant Tumors.

Sixty-four cases of malignant kidney disease are collected by Albert Siegrist (*Correspondenzblatt für Schweiz. Aerzte*, August, 1888), in sixty-one of which nephrectomy was performed. In the remaining three cases explor-

atory incision showed that the operation was not practicable. In 52½ per cent. of these cases death followed immediately upon the operation. Of the remainder, 15 per cent. perished, within eighteen months, of recidivity or metastasis. Sufficient time has not elapsed to determine the percentage of permanent cures; but Krönlein's patient was in good health four years after the operation, and four other patients have been free from trouble for two years.

The mortality of intra-peritoneal operation is much greater than in the extra-peritoneal method; 58 per cent. in the former against 27 per cent. in the latter. In so far as recidivity is concerned, however, the figures are entirely reversed—being 5 per cent. for intra-peritoneal excision against 41 per cent. for the extra-peritoneal operation.

Siegrist commends Israel's method of exploration as most successful in examination of the kidney. The patient lies upon the sound side, beneath which a thick roll or pad is thrust, while the body is turned to a half abdominal decubitus. The fingers are now pressed beneath the lower border of the ribs on the bulging side, and can readily palpate the kidney during deep inspiration.

The frightful mortality of these operations can be avoided—by refusing to attempt hopeless cases; by early diagnosis and surgical interference; by strict adherence to the extra-peritoneal method.

Tubercular Cystitis.

To the few recorded cases of operative treatment for tubercular cystitis Reverdin (*Annales des Maladies des Organes Génito-urinaires*, t. vii. No. 6) adds yet another of especial interest because the tubercular lesions were not limited to the bladder. Unfortunately no bacteriological examinations of the urine were made, but the diagnosis was sufficiently plain from unmistakable lesions of the external genitals, from the excessively frequent micturition, from the intense pain, and from the hæmaturia.

The bladder was opened by the suprapubic incision without employing rectal distention, and was illuminated by an electric lamp. Some ulcerating points and fungous granulations were cauterized, the edges of the bladder incision were sutured to the skin, and the operation was completed by insertion of two rubber drainage tubes. The subsequent course of this case was satisfactory, except that a urinary fistula was left which was only closed with great difficulty after a long period, and from which a quantity of tubercular granulations were curetted. All bladder symptoms disappeared, except a tendency to frequent micturition, and the tubercular involvement of the external genitals remained localized. The patient subsequently developed a perinephritic abscess some three years after the operation, in spite of which he was apparently in excellent health at the time the case was reported.

Incontinence of Urine.

Guyon has long since shown the clinical value of the electrical treatment in the therapeutics of incontinence of urine. Unlike Weber, Manduit, and others who preceded him, Guyon applies the current directly to the mem-

branous urethra with the idea of increasing the tone of the true vesical sphincter, and has reported many brilliant cures as a result of this treatment.

JAMIN (*Annales des Maladies des Organes Génito-urinaires*, t. vii. No. 6) publishes a case in which electrical applications were equally serviceable in a young woman affected with nocturnal incontinence since infancy. This patient had been subjected to most thorough and exhaustive trials of all the ordinary remedies. The hope of amelioration with the appearance of the menses had not been realized. Belladonna pushed to its extreme physiological limit had been of no avail. Finally she reluctantly consented to local electrical treatment. This was continued for one month, the application being made every other day, and resulted in a complete cure. The urethral electrode (No. 16 olive-pointed) was attached to the negative pole, and was passed up and down along the whole extent of the urethra. The positive electrode was placed upon the thigh to avoid all action upon the bladder. Each séance did not last more than five minutes, and the current strength was not sufficient to cause pain.

FRACTURES OF THE NECK OF THE FEMUR.

SENN contributes a characteristically able article (*Journal of the American Medical Association*, August 3, 1889) upon fractures of the neck of the femur. Six years ago he published over fifty cases in which bony union after intra-capsular fracture had taken place, and practically demonstrated the fact that non-union was due more to inefficient treatment, to imperfect immobilization, than to any inherent peculiarity in fractures of this region, By means of experiments upon cats he showed that intra-capsular fractures treated by the ordinary expectant method, or by means of plaster-of-Paris casts, showed no evidence of bony union, while in those in which the fragments were pinned together by means of bone pegs, bony union, or union by means of an exceedingly short ligament, without any displacement of the fragments, was obtained. The fact that in impacted fractures satisfactory results are usual, is an additional proof that failure in these fractures is due to imperfect fixation. A brief anatomical study readily shows that the old method of extension and sand-bags neither approximates the fractures nor keeps them in fixed position.

The diagnosis of this fracture, when complete, is comparatively easy; if partial or impacted, however, it may become exceedingly difficult. The three cardinal symptoms to be considered are: the position of the trochanter major, shortening, and eversion. In all fractures, except the partial, the upper border of the trochanter major will be found above the Roser-Nélaton line (a line drawn from the anterior superior spinous process of the ilium to the tuberosity of the ischium).

The examination of the patient never requires the administration of ether, nor should the surgeon endeavor to elicit crepitus or preternatural mobility. The clothing having been removed as far as the chest, and the patient having been placed upon a hard, smooth, unyielding surface, careful measurements, aided by inspection and palpation, are usually sufficient to determine accurately the nature of the injury. The treatment advocated in fractures through any portion of the femoral neck consists in the fulfilment of two principal indications: (1) Immediate reduction. (2) Permanent fixation.

In impacted fractures, the second indication alone is regarded, no attempt being made to correct any of the displacements.

Since, in all intracapsular fractures, union is effected entirely by the production of intermediate callus between the broken surfaces, no external or provisional callus being formed, the mechanical support upon which coaptation depends must be retained much longer than would be necessary in other localities. In no case should the retention apparatus be removed in less than eighty or a hundred days.

Permanent fixation of an impacted fracture in the position in which it has been placed by the accident, is necessary for the following reasons:

1. It prevents disengagement of the fragments.

2. It obviates secondary shortening and eversion during the stage of interstitial absorption which attends inflammatory osteoporosis.

3. By keeping the injured parts at rest, it serves as a prophylactic measure against the accession of arthritis and para-arthritis.

4. It enables the patient to leave the bed any time after the dressing has been applied, and thus guards against decubitus, hypostatic pneumonia, and other affections incident to prolonged confinement in bed.

The advantages arising from immediate reduction and permanent fixation in fractures of the neck of the femur are the following:

(*a*) The untorn portions of the joint structures are replaced at once into their normal relations; a procedure which cannot fail to influence favorably the circulation in vessels which may have escaped injury.

(*b*) The sharp and irregular margins of the broken surfaces act as irritants to the surrounding soft tissues; immediate reduction, by placing the fractured surfaces at once into mutual coaptation, acts as a preventive agent against the supervention of undue inflammation in and around the hip-joint.

(*c*) With coaptation the process of repair is initiated at once, the blood and exudation material between the fragments act as a temporary cement substance, and, at the same time, serve a useful purpose in reëstablishing the interrupted circulation.

(*d*) Perfect reduction and permanent fixation prevent muscular spasm and diminish pain.

Senn originally proposed immobilization by means of a steel pin regulated by a screw passing through the centre of a curved steel bar incorporated in the plaster-of-Paris splint over the fenestrum. This pin was so arranged that its point would, by penetrating the bone, procure immobility of both fragments by lateral pressure. In some cases transfixion of both fragments by an ivory or bone nail was advocated. Clinical experience has since proven that the same object can be accomplished by well-regulated lateral pressure in the direction of the axis of the femoral neck, combined with perfect fixation of the lower fragment upon the pelvis.

The method of treatment is as follows: The fractured limb is incased in a plaster-of-Paris dressing as far as the middle of the thigh, the patient is then lifted out of bed and, supported on either side, stands with the sound leg upon a stool about two feet in height. An assistant takes charge of the injured limb and either holds it immovable in impacted fractures, or makes the requisite amount of extension if there is no impaction. In applying the plaster-of-Paris bandages over the seat of fracture, a fenestrum large enough

for the application of the lateral compress is left open over the great trochanter. Perfect immobility is secured by including in the plaster dressing the fractured limb, the pelvis, the opposite limb down to the knee, and the trunk as far as the cartilage of the eighth rib. The splint, which consists of a steel bar provided at the ends with lateral flanges and bowed out in the middle, is incorporated in the plaster dressing with the bowed portion directly over the trochanter major. This part is provided with a set screw which drives a stiff, well-cushioned pad so that pressure is made in the axis of the femoral neck. By this means a condition resembling impaction obtains in non-impacted fractures. In about three months the dressing is removed, but the patient is not allowed to put his weight upon the injured leg for one to three months longer.

Seven cases are reported in which the results of this treatment were gratifying in the extreme. The patients recovered almost complete functional activity in each instance.

In extreme obesity or debility, in patients suffering from concomitant fatal maladies, and in certain cases of fracture of the femoral neck, the treatment is not applicable, but in all cases where there is a reasonable hope that bony union may be obtained by fixation, it should be recommended.

Finally, as a result of his experimental and clinical study of the subject, Senn draws the following conclusions:

1. From a scientific, prognostic, and practical standpoint it is not necessary to make a distinction between intra- and extra-capsular fractures of the neck of the femur.

2. An impacted fracture of the neck of the femur will unite by bony union, provided the impaction is not disturbed and is maintained by appropriate treatment for a sufficient length of time for the fragments to become united by callus.

3. Impacted fractures of the neck of the femur should be treated by a fixation dressing consisting of a plaster-of-Paris case, including the fractured limb, the pelvis, and the opposite limb as far as the knee, in which a splint should be incorporated by which lateral pressure can be secured in the direction of the axis of the broken femoral neck.

4. Unimpacted fractures of the neck of the femur, both intra- and extra-capsular, should be treated by immediate reduction and permanent fixation, so as to place the fragments in the same favorable condition during the process of repair as in impacted fractures.

5. Reduction is effected most readily by auto-extension and traction upon the fractured limb with the patient in the erect position, resting his weight upon the sound limb.

6. The fixation dressing should not be removed and the lateral pressure should not be discontinued for from ten to twelve weeks, the shortest space of time required for bony union to take place.

7. Patients who have sustained a fracture of the neck of the femur should not be allowed to use the fractured limb earlier than four to six months after the accident, for fear of establishing a pseudo-arthrosis at the seat of fracture.

8. The functional result is greatly improved by passive motion, massage, and the use of the faradic current.

Ligation of the Innominate Artery by Median Incision.

For the now practically abandoned method of treating subclavian aneurism by ligation of the innominate artery, Spencer (*British Medical Journal*, July 13, 1889) puts forward an earnest plea. That the operation is Hunterian in character cannot be doubted, and the fact that other means of treatment have been nearly as unsuccessful in result as this rather formidable operation, suggests that the latter should be carefully reviewed with the idea of determining whether the almost uniformly fatal result is inherent in the procedure, or is rather due to its imperfect application. To this latter idea the writer inclines, and a study of thirteen tabulated cases shows suppuration, distal hemorrhage or imperfect occlusion to have been the causes of failure.

Suppuration he proposes to avoid by a median incision dividing no muscular fibres, but separating the sterno-hyoids and sterno-thyroids in the median line. The right common carotid artery is then found, and, following this as a guide, the innominate artery is readily reached. This leaves no cavity, no blood-clot, and there is no necessity for drainage.

The artery should be absolutely occluded, and the inner coats ruptured by a strong, tightly drawn antiseptic silk ligature. Distal hemorrhage is to be avoided by synchronous ligation of the right common carotid artery.

Carefully observing this point, the author ligated the innominate artery of three monkeys. The animals were killed five weeks, ten weeks, and twelve weeks after the operation respectively, and the post-mortem examination showed that the artery was firmly closed by scar tissue. In another monkey a catgut ligature was used, and the carotid artery was not tied. The animal died on the seventh day from hemorrhage, due to distal perforation of the artery. This has been the immediate cause of death in man, and is to be avoided by ligating the carotid, thus allowing a proximal clot to extend as far as the origin of the vertebral artery.

In this connection a most interesting case of successful ligation of the innominate and carotid arteries is reported by Lewtas (*British Medical Journal*, August 10, 1889). A month before admission to the hospital, a piece of gun metal had lodged in the patient's neck just above the clavicle. For three days there had been persistent bleeding from this wound. On examination, the outline of the right clavicle was obliterated by a tumor the size of a child's head, hard and non-pulsatile. There was a partly healed wound an inch in length just above the clavicle and in front of the attachment of the sterno-mastoid muscle. From this wound a brownish blood was oozing. A diagnosis of abscess beneath the deep cervical fascia was made, and the wound was enlarged. Digital examination showed the presence of a foreign body, which was removed by dressing forceps, and proved to be an irregularly shaped piece of steel, weighing three drachms. There was immediately an alarming hemorrhage, so profuse that the bleeding point could not be found. Finally, the finger passed to the bottom of the wound discovered an opening in the subclavian artery behind the anterior scalene muscle. Efforts at seizing this opening in hæmostatic forceps proving unavailing, an incision was made along the inner border of the sterno-mastoid muscle, the outer borders of the sterno-hyoid and sterno-thyroid muscles were notched, a catgut ligature was passed around the common carotid artery, and with the latter as

a guide the innominate artery was freed and tightly ligatured. The original wound cavity was partly cleared of clots and drained. The patient was so profoundly collapsed that he was taken to the ward before the completion of the operation; he remained senseless for two hours, but slowly reacted and was discharged cured on the forty-fifth day with no perceptible pulse at the wrist and only a feeble beat to be felt in the pulmonary artery.

Lewtas records this as a case of aneurism. His own notes would, however, show it to be a hæmatoma due to an injury to the subclavian artery.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, M.D.,
AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

A New Pathogenic Mould Fungus in the Human Auditory Canal.

M. Lindt, of Berne, describes what he terms a new fungus in the human ear, and calls it the *Eurotium malignum*. The other forms of pathogenic fungi heretofore described, are the *Aspergillus fumigotus* (Fresen); *A. flavus* (Brefeld, Wreden); *A. niger* (v. Tilghem, Wreden), and *A. nidulus* (Eidam, Siebermann); to which the author claims to add a fifth.—*Archiv. f. Experimentalle Pathologie u. Pharmakologie*, Bd. xxv., and *Archiv. f. Ohrenh.*, Bd. 28, June, 1889.

On the Treatment of Aural Exostoses.

The above was the title of the opening address by George P. Field, M.R.C.S., etc., before the Section of Otology at the annual meeting of the British Medical Association, at Leeds, August, 1889 (*British Medical Journal*, August 24, 1889).

The rarest form of aural exostosis consists simply in a general thickening of the walls of the osseous meatus. Usually only a limited area is affected. Their causation seems to be due to some local source of irritation of the ear. There are as yet no conclusive data that they are due to syphilis, scrofula, gout, or rheumatism. In many instances they are probably due to the irritation of the ear by salt water introduced repeatedly during a long course of sea baths.

The surgeon has to consider in any case of exostosis in the auditory canal whether an operation is necessary, and if so, how soon it should be undertaken. Mr. Field's experience is that it is far better to operate whilst there is room left to guide the drill, should that be required. The dangers of operating in an occluded ear are great.

The removal of a soft exostosis is comparatively easy, but "the destruction of one of the intensely hard, broad-based aural exostoses, or hyperostoses, apart from the exercise of considerable patience and a variety of precautions, and the employment of special measures, is an undertaking at once difficult, tedious, and uncertain."

The dental engine has been found by Mr. Field to be a "uniformly satisfactory" means of removing these growths. This engine is more under control, in his experience, when worked by the foot than by means of electricity. He prefers it greatly to the mallet and chisel.

The Care of the Teeth from a Medical Practitioner's Standpoint.

Under this title, Dr. Samuel Sexton has contributed an interesting and valuable paper (*Medical Record*, June 1, 1889).

He confines his remarks to a consideration of dentition, caries of teeth, and some of the neuroses resulting therefrom. It is claimed that if "rational methods of research—such as have characterized the exact study of diseases of that group of special sense-organs comprising the ear, nose, and eye, and contributing so greatly to the success of specialism—were brought to bear throughout the field of oral surgery, the marked indifference of physicians toward this specialty would soon cease to exist."

Dental disturbances, of course, are most marked at the time of the first dentition, the completion of the second dentition at puberty, and the eruption of the wisdom teeth. It is claimed that the first period is often a time of exacerbation of ear, nose, or eye disease, and even of convulsions.

Second dentition may be a severe ordeal, and if children are badly fed or clad, or overworked mentally or physically, they are liable to give way under the strain. The exanthemata are badly borne at such times, and the nutrition of the teeth interfered with.

A number of such defects are known to occur with considerable uniformity, but "the writer has looked in vain for characteristically marked teeth which might be traced to any particular disease, such as have been described by Hutchinson as due to syphilis." Until all the second teeth are through, the teeth of the child should be kept under observation, "since many nervous affections are due to the physiological disturbances they give rise to, and being unattended by pain, are liable to be overlooked."

In the case of the wisdom teeth, "whether the pains of eruption are great, or absent altogether, the ear, nose, and tonsils often suffer very much from the long-continued irritation through nervous sympathy."

In regard to diseased teeth, and so-called dead teeth, their retention in the jaws is deprecated, since a very large number of persons coming under Dr. Sexton's notice, with diseases of the ear, could not be successfully treated until the affected teeth were removed. It is also maintained that there is a "danger to health from all fixtures, now so commonly worn in the mouth, requiring for their retention the remains of defective teeth, as caps, crowns, bridges, and other metal attachments. Pivot teeth, and transplanted or replanted teeth, are likewise more or less detrimental, as are also ill-fitting and vulcanite plates."

It appears that dentists are too often wanting in surgical knowledge, and that surgeons who take up dentistry are unable to acquire the practical mechanical skill requisite in dentistry. It is suggested in this paper that the "sooner a greater knowledge of oral surgery than generally prevails is made requisite for graduation by medical schools, the better it will be for all concerned." Also, it is further suggested that, "if medical schools undertake to educate dentists, it would be well to bear in mind the necessity for thoroughly equipped laboratories in which metal-working may be taught."

Antiseptics in the Treatment of Otorrhœa.

Dr. Robert L. Randolph, of Baltimore, Md., has written a very interesting article on this subject (*Medical Record*, July 27, 1889). He prefers what he terms an acid solution of the bichloride of mercury to boric acid, iodoform, or carbolic acid. The following prescription is the one most frequently employed:

R.—Hydrarg. bichlor	. . . . .	gr. ss.
Acid. tartaric.	. . . . .	gr. xx.
Aquæ	. . . . . q. s. ad.	f℥vj.

The patient is first required to syringe out the discharging ear with warm water, and then to pour in the sublimate solution until the ear is full.

Acid is added to the solution of bichloride of mercury to prevent precipitation of albumen from the secretion in the ear. Its germicide power is rather enhanced than decreased by such addition of acid.

The Influence of the Form of the Skull upon some Important Topographic Features in the Temporal Bone.

Otto Körner, of Frankfurt-on-the-Main, has concluded, from an examination of twenty-nine skulls, that, first, the floor of the middle fossa of the skull in doliocephalic subjects is higher above the porus acusticus externus and the spina supra meatum than in brachycephalic skulls; and, secondly, that on both sides the sigmoid flexure of the transverse sinus in brachycephalic skulls lies deeper forward and outward in the bone than in the doliocephalic. Since, then, the sinus transversus in its sigmoid flexure lies deeper in the mastoid and the base of the petrous pyramid, on the right side than on the left, and as the more frequent occurrence of the sequelæ of caries of the petrous bone on the left side is thus explained, therefore the prognosis respecting the aforesaid sequelæ of otorrhœa in the brachycephalic is decidedly more unfavorable than in the doliocephalic. The author repeats his opinion, that in all cases of operative perforation of the mastoid, the opening should be made far forward in adults with a cranial index of 1.30 (*Zeitschr. f. Ohrenh.*, Bd. xix., and *Archiv f. Ohrenh.*, Bd. 28, June, 1889).

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

OF PHILADELPHIA.

Hemiatrophy of the Tongue.

Dr. R. v. Limbeck reports and illustrates (*Prager med. Woch.*, No. 16, 1889) a case of right-sided hemiatrophy of the tongue in a married woman, thirty-eight years of age, in which the causal central lesion was as yet limited to the nucleus of the hypoglossal nerve. There was a slight paresis of the right vocal band, but no appreciable lesion elsewhere.

Pharyngitis in Influenza.

Dr. G. Merkel has referred (*Münch. med. Woch.*, No. 21, 1889) to a great number of cases seen in hospital practice in which there was acute catarrhal pharyngitis without swelling of the tonsils, with slight congestion of the palate but with intense tumefaction and congestion of the posterior wall of the pharynx. Severe general pharyngitis began with a temperature exceeding 38° C. the first evening, and reaching 40° C. the second day, falling so on the third day that the temperature became normal in the evening. The pharyngitis subsided slowly, the patient recovering on the eighth day. There was no bronchial manifestations. Tumefaction of the spleen occurred often, but not regularly.

Exudative Erythema in the Throat.

At a meeting of the Laryngologischen Gesellschaft zu Berlin, held May 10, 1889 (*Berliner klin. Woch.*, July 8, 1889) Dr. Schoetz described under the title *Erythema exsudativum in den Halsorganen*, a unique case of sore throat in a merchant forty years of age, which began suddenly with fever and severe sore throat on May 26, 1888. Odynphagia followed, and increased in severity; and intense headache, rheumatic seizures in the legs, and profuse salivation soon became superadded, with occasional expectoration of small quantities of blood. On the fifteenth day of the disease the patient applied to Schoetz, complaining chiefly of his throat, and incidentally of discomfort in the head, noises in the ears, and pains in his limbs. There was intense general congestion of the mucous membrane of the mouth and pharynx. In the centre of the posterior wall of the pharynx was a flat ulcer the size of a five-cent piece, with yellowish-gray floor and adherent edges. A few discrete aphthous ulcerations occupied both surfaces of the gums of both jaws. The mucous membrane of the larynx was strongly congested and somewhat diffusely swollen. On the anterior surface of the posterior wall of the larynx, especially just beneath the left vocal band, there were projecting masses such as are seen

in *pachydermia laryngis*. There were no glandular swellings, nor was there anything abnormal in the remainder of the body.

Two days later the swelling in the larynx had undergone ulceration, the pharyngeal ulcer had enlarged, and a flat ulcer the size of a bean appeared on the vault of the pharynx, to the right of the middle line. The pains in the limbs were severe. An exanthem had appeared on the dorsal surfaces of the wrists and ankles, in the form of dark bluish-red papules, from the size of pin-heads to that of beans, with clear areola. This exanthem extended in a few days, under marked rheumatoid pains, over various portions of both upper and lower extremities, near the joints, which became markedly swollen. Efflorescences became developed at the tip of the nose, on the scrotum, and on the prepuce. The exanthem became irregular. While the ulcers in pharynx and larynx were undergoing cicatrization, two ulcers formed in the right half of the rhinopharynx above and behind the projection of the Eustachian tube. Considerable mucopurulent secretion, in part with sanious admixture, was discharged by the right nostril. The lower turbinated body became superficially ulcerated posteriorly. The fever increased, and there was great complaint of intense malaise, and of pains over the entire body.

By June 20th, the cutaneous exanthem had in great measure subsided. The old ulcers in the mucous membrane were in part entirely healed and in part partially healed. A fresh ulcer, the size of a bean, had appeared on the right tonsil; and papules had appeared on the left posterior palatine fold and on the gums, which ulcerated on the next day, when the process seemed to come to a standstill.

On June 26th, the patient went to Ems, where he became much worse. Fever recurred, fresh ulcers formed on various portions of the tongue, on the soft and hard palate, the lips, the cheeks, the right palpebral conjunctiva, the posterior wall of the pharynx, and the left ventricle of the larynx (Dr. Goltz); with fresh efflorescence on the extensor surfaces of the hands and feet, with moderate swelling of the joints.

The patient returned to Berlin, August 6th, with an additional fissure-like ulcer in the mucous membrane of the anus. Four days later, under the influence of warm weather, great improvement took place. With various changes, including ulcerations on the posterior surface and edge of the epiglottis, the condition continued practically unchanged until January 3, 1889, when marked exacerbation took place, quickly followed by permanent improvement. By January 13th, all the ulcers had healed. There were still moderate headaches, and contractures in the right heel. Since then the patient had had no complaint worth mentioning. The only remedy that had been efficacious was arsenious acid.

Syphilis of the Pharynx, with Membranous Stricture of the Larynx.

P. Heymann exhibited to the Laryngologische Gesellschaft zu Berlin (*Deutsche med. Woch.*, No. 29, 1889) a lad thirteen years of age, who had been for three years under his treatment with syphilitic ulcerative lesions of the nose, upper lip, tongue, epiglottis, pharynx, and palate; and who had an ulcer on the hand. Though his condition had been much improved, the progress

had not been very satisfactory. The ulcer in the hand had completely healed. The ulcerative process in the tongue had completely terminated in cicatrization, and that in the pharynx was nearly complete. The ulcerations in the nose and upper lip had progressed steadily. A portion of the nose was completely destroyed, and the left nasal passage was completely closed by cicatricial contraction. A flat, red diaphragmatic membrane, starting from the stump of the epiglottis, just beneath its free border, stretched backward and downward; and under its posterior portion, the outline of the arytenoid cartilages could be made out. The laryngeal orifice, hardly of the size of a notebook pencil, was backward and to the side, and allowed a to-and-fro movement, attributed to the vocal bands, to be seen through it on phonation. Deglutition was not impeded. It was proposed to dilate the stricture. The child was the fourth of seven healthy children, both of whose parents were apparently healthy, without any indications or history of syphilis.

FRÄNKEL spoke of a similar case under his care, in which the diaphragm was located higher.

LUBLINSKI spoke of three cases he had reported in the *Berliner klin. Woch.*, No. 24, 1883, in each of which a membranous cicatricial new formation stretched from the base of the tongue to the posterior wall and sides of the pharynx. The openings in these membranes were three-quarters, one-half, and one and a quarter centimetres respectively. The worst two had been successfully operated upon, and in one of them whom he had examined eight years later, the relief had been permanent.

PHLEGMONOUS LARYNGITIS.

B. FRÄNKEL has reported (*Deutsche med. Woch.*, July 18, 1889) a rare instance of idiopathic phlegmonous laryngitis in an imbecile who, despite opportune tracheotomy, had died with œdema of the glottis which had supervened upon insignificant laryngeal symptoms of only a few days' duration. Œdematous infiltration was well marked in the epiglottis and in the ary-epiglottic folds. There were abscesses and phlegmonous infiltration of the submucosa in the region of the arytenoid cartilages. The right crico-arytenoid joint contained pus, and the arytenoid cartilage was laid bare in spots. In the region of the left posterior vocal process was a fistulous orifice representing the point of rupture of an arytenoidal perichondritis, the cartilage being largely loosened from its perichondrium. Microscopic examination of the mucous membrane revealed its thick infiltration with round cells, especially in the submucosa. There were no traces of syphilis on the body of the subject; and no tubercle bacilli could be detected in the pus or in the tissue.

INTUBATION OF THE LARYNX.

In an article on intubation of the larynx by O'Dwyer's method, DR. O. GUYER, assistant physician in the Children's Hospital of Zurich, comments favorably upon his own experience (*Correspondenzblatt für Schweizer Aertze*, July 1, 1889), having begun it with much misgiving.

Intubation had been practised in twenty-seven cases of acute stenosis of the larynx, all of them so intense that the only choice of treatment had been

between tracheotomy or intubation. Recovery ensued in thirteen cases; the two youngest of which were 8 and 13 months of age; two were 2 years old, two less than 4, three less than 5, three less than 6, and one less than 7. In all these children but the eight-months old babe, membranes had been expectorated, so that there was no doubt as to the diphtheria. In the fourteen fatal cases, the cause of death was extensive bronchial diphtheria in eleven; pneumonia in two, and nephritis in a girl eight years of age, after recovery from the diphtheria. Moderate bronchial pneumonia and turbid swelling of the kidneys were found in nearly every autopsy. The deaths occurred in one child of 1 year of age, in two of 1½ years, in four each of 2 and 3, three each of 4 and 5, two of 6, and in one each of 8 and 9. This success of forty-eight per cent. is much greater than had been attained previously by tracheotomy; and is much greater than the success reached in the United States.

The details of a few interesting cases are followed by warm commendations of intubation; which are confirmed in the appendix to the article by Dr. Wilh. v. Muralt.

Tuberculous Abscesses of the Cricoid Cartilage Rupturing into the Track of the Tracheotomy Wound.

Dr. L. Grünwald, of Munich, reports (*Münch. med. Woch.*, No. 21, 1889) an interesting case somewhat unusual in its initial stages and in the manner of rupture. A married woman, thirty-nine years old, came under treatment July, 1888, with slightly developed pulmonary phthisis. In September, there was great dyspnœa and loud tracheal stridor. There was great impediment in the abduction of the right vocal band, which was in the median position. One month later this band was in almost complete cadaveric position. The paralysis of the recurrent nerve was attributed to compression by infiltrated tuberculous tracheal glands, which likewise produced the dyspnœa by pressure on the trachea. Dyspnœa and spasmodic cough continued unchanged for nearly three months, when the breathing suddenly became free for several days, and then gradually became worse and worse so that the patient could breathe only sitting upright, and often pulled the epiglottis forward with her forefinger just to get breath. In this condition January 8, 1889, both vocal bands were seen to be symmetrical and freely mobile. The subglottis, however, was completely obstructed by two red tumefactions beneath the vocal bands and a third one beneath their commissure. There was no ulceration. The right half of the cricoid cartilage was painful to pressure. Tracheotomy was performed the next day. On January 14th the right bronchus could be freely disclosed by tracheoscopy from the wound. Ten days later dyspnœa recurred, and there was some difficulty with the canula owing to increase in the growth and its projection into the fenestrum. The voice was good, however, and there was no stridor. The swellings beneath the vocal bands had nearly disappeared. A portion of the subglottic growth was severed with a snare, and immediately a large quantity of thin pus escaped from the larynx and trachea. The abscess had been opened in the interior of the larynx by the removal of the mass of granulations. Pus could be pressed from the abscess, too, by pressure just above the tracheotomy wound, where there was a dense irregular tumefaction in the cricoid region. Profuse discharge of

pus escaped subsequently by the tracheotomy wound, showing that the abscess had ruptured into the wound shortly after it had opened into the larynx. The external tumefaction subsided by February 4th, and the laryngoscopic image became normal. The pulmonary disease progressed very rapidly in the exhausted patient, and death took place February 12th. The autopsy confirmed the diagnosis. A fragment of necrosed cartilage was found in the abscess.

A second case of rupture of the abscess through the tracheotomy wound was found by Grünwald in *post-mortem* examination of a man forty-seven years of age, who, after many years suffering with laryngeal tuberculosis, had been tracheotomized in December, 1887, and had died February 18, 1889.

Carcinoma of the Œsophagus.

At a meeting of the Berliner medicinischer Gesellschaft, Dr. Ewald exhibited (*Münch. med. Woch.*, No. 21, 1889) an œsophagus with carcinoma, in which a large diverticulum was found below the stenosis. The walls were very much thinned by shrinkage of the mucous membrane and atrophy of the muscles, so that a stasis of the ingesta had taken place, the weakened musculature having lost the power to force the food further, which therefore remained a certain time in front of the cardiac orifice.

Some Successful Work in Œsophagoscopy.

Dr. v. Hacker reports some interesting personal experience (*Wien. klin. Woch.*, No. 23, 1889) in Billroth's clinic. In a man thirty-one years of age, who for five months had symptoms of œsophageal stricture, the cause was discovered by means of a straight tube and Leiter's panelectroscope; and several excrescences around the ulcerated circumference of the stricture were removed with forceps for microscopic examination. In strictures from caustic lye and the like it is not easy to practise œsophagoscopy. In one instance the upper portion of the stricture could be seen very well. It looked like the mouth of a uterus. The normal plication of the œsophageal mucous membrane was absent, and the changes of lumen by the respiratory acts was much less than normal. The interior of the stricture could be seen clothed with uneven, white cicatricial masses, and a sound could be passed through it under the guidance of vision.

In carcinoma very distinct views were often obtained of the two chief seats, the region of the tracheal bifurcation and above the cardia, as well as the occluding infiltrated places in the mucous membrane, and the exulcerated portions and the excrescences. In three cases particles had been removed with forceps for microscopic examination. In two cases of carcinoma incarcerated pieces of meat had been detected and extracted with forceps.

In two cases foreign bodies had been detected in the normal œsophagus; in one instance a denture, which was removed through the tube with forceps; in the other a large mass of meat, which had glided into the stomach by peristalsis on being touched with the forceps.

In two cases of dysphagia without stricture and attended with detention of food and regurgitation, the mucous membrane of the cervical portion of the œsophagus appeared as though longitudinally scorched in one instance; and

in the other several fissures were seen in the lower portion. This suggested that spasmodic contracture of the œsophagus might take place in fissure analogous to the contractions which take place in fissure of the anus. A case in point was narrated in which carcinoma of the cardia had been diagnosticated in a man who had been in the habit of chewing and swallowing chicken bones; and post-mortem examination revealed changes due to injuries thus produced, but no carcinoma.

Syphilis of the Nose.

Lublinski reports (*Deutsche med. Woch.*, July 18, 1889) a case beginning with swelling of the tip and occlusion of one of the passages, fifteen years after a primary infection which had been promptly cured without subsequent manifestations. Granulations filled up the passages, and there was complete destruction of the cutaneous, and partial of the cartilaginous septum.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL.

The Most Probable Time of Conception.

Schneider (*Memorabilien*, August 7, 1889) considers the period just before the menstrual flow, when the ovum has escaped from the ovisac and is traversing the Fallopian tube, and, following this, the period during which spermatozoa retain vitality in the genital passage of the female, to be the time when conception is most likely to occur. This time would be the four days preceding the menstrual flow and the eight days following, twelve days in all. In support of this he instances the Mosaic law, which forbids intercourse for fourteen days after menstruation. The Jews were very prolific, and Schneider believes the most fruitful intercourse is before menstruation, when coition favors the rupture of the ovisac; after menstruation he believes coition is less often followed by conception.

Hegar's Dilators, of Large Size, for Inducing Labor.

Lewers (*Lancet*, August 3, 1889) has used Hegar's dilators of large size, especially constructed for the purpose, for inducing labor. The series usually employed stops at No. 26; Lewers' series continues to No. 40, the largest measures one and three-quarters inches in diameter. When the largest has dilated the cervix the membranes are ruptured. A preliminary antiseptic vaginal douche is given, and the bougies are introduced in succession, the intervals becoming longer as the bougies increase in size. Barnes's dilators may be used to advantage if the largest of the series fails to induce pains.

Lewers reports three cases in which these dilators were used most satisfac-

torily. In the first the flexible bougie failed to induce labor and the dilators succeeded; the patient's previous children had been so large that they perished in labor, although no pelvic deformity existed. Labor was induced in the thirty-fifth week, and mother and child recovered. In the second case labor was induced by this method because previous labors had resulted in the death of the fœtus, which had always been of excessive size. Spontaneous delivery followed the induction of labor and mother and child recovered. In the third case labor was induced at the thirty-second week for contracted pelvis, caused by multiple deformity from arthritis of the knees and hips. Mother and child recovered, the head being delivered by the forceps when it reached the pelvic floor.

During the induction of labor the vagina is disinfected by repeated douches. The dilators lie in a porcelain tray immersed in a 2½ per cent. solution of carbolic acid, and are dipped in terebene oil 1 : 5 before insertion. Sims's speculum is used to expose the os uteri, and tenaculum forceps used if required.

Extra-uterine Pregnancy, with Spontaneous Recovery.

Thompson (*American Journal of Obstetrics*, August, 1889) reports the case of a primipara who suffered from disordered menstruation, with attacks of pain and prostration, sometimes accompanied by a vaginal discharge. After a year's illness a tumor about as large as an orange was formed low in the abdomen on the left side; it was thought an ovarian cyst or a fibroid. A month later the abdomen suddenly increased in size, with abdominal pain; cystitis developed and was attended by the passage through the urethra of a number of small, hard bodies, which were found, by microscopical examination, to be fœtal bone. Gradual improvement, and finally restoration to health followed, with resumption of menstruation.

The Indications for the Cæsarean and Porro Operations.

Piskacek sends us a recent reprint from the *Wiener klinische Wochenschrift*, 1889, giving an account of Breisky's method of performing the Porro operation in his clinic at Vienna, and stating indications for this and the Sänger operation. He would perform the Sänger operation only under the most favorable surroundings, when delivery through the natural passages is impossible and proved so by observation, and when the mother greatly desires offspring and has been informed of the dangers of the operation; it should generally be performed on multiparæ who have lost children in previous dangerous labors. In primiparæ Cæsarean section should not be done except when there is imminent danger of uterine rupture. In other cases craniotomy is clearly indicated.

The Porro operation should be performed in cases where the *conjugata vera* is less than two and three-quarters inches, as repeated pregnancies would necessitate repeated Cæsarean operations, and in each such pregnancy there would be danger of uterine rupture; and also in osteo-malacia.

It was performed by Breisky as follows: After the patient was cleansed and disinfected and the vagina filled with iodoform gauze, the uterus was turned out through the abdominal incision and an elastic ligature placed about the cervix; the abdomen was temporarily closed behind the uterus by several

stitches. The fœtus was removed through uterine incision. An acupressure needle was then passed through the cervix over the ligature and an écraseur passed below the needle and a second above it. Uterus and ovaries were then removed, and both écraseurs tightened until the pedicle was bloodless. Before the final adjustment of the écraseur wires the abdomen was closed with silk, only the lowest stitch being silver wire, to bring the peritoneum as far internal as possible: in none of Breisky's 11 cases were the parietal peritoneum and that of the pedicle joined. The écraseurs were then tightened, the uterus removed, the mucous membrane of the cervix partly excised to prevent fistula, and the stump cauterized with Paquelin's cautery. It was dressed with plaster-of-Paris and oil of cade, 100 to 15. Mummification always ensued, without complication. A heavy antiseptic dressing was then applied, and the stump allowed to remain undisturbed for a week or more if the patient had no fever. When the dressing was removed the stump was usually found in dry, odorless necrosis.

The description of 5 Porro operations and 4 Sänger sections is appended. Breisky's statistics number 11 Porro operations, with no mortality.

Two Successful Sänger Sections for Contracted Pelvis.

Wolcynski (*Wiener klinische Wochenschrift*, No. 27, 1889) reports two successful Sänger sections for contracted pelvis. The first was a flat, rachitic pelvis, *conjugata vera* 1.8 inches, in which the mother was but two and a half times larger than the fœtus. The operation was done by Sänger's method, when the pains began; to prevent protrusion of the intestines, temporary stitches were taken through the abdominal wall before the uterus was turned out of the abdomen. The second case was that of a pelvis of high degree of osteomalacia, in which the operation was typical, after Sänger's method. Prompt recovery followed in both patients. In the latter the mother was only eight or nine times larger than the child, the normal ratio being 1 to 20.

Hæmatoma of the Vulva Causing Retention of the Placenta.

Chazan (*Centralblatt für Gynäkologie*, No. 30, 1889) reports the case of a multipara, to whom he was called three hours after labor because of retained placenta. On examination, a hæmatoma as large as a child's head was found in the right labium, of one and a half hours' duration. It was thought best to deliver the placenta before opening the hæmatoma, if possible. While this was being done the tumor ruptured at its most dependent part. The slight hemorrhage which followed was easily checked by a carbolized tampon. The tumor was gradually absorbed. Fever was present for eight days, but in fourteen days absorption was nearly complete, and a good recovery ensued. The cause of the hæmatoma could not be ascertained.

Post-partum Shock from Compression of the Ovaries.

Ferguson (*Edinburgh Medical Journal*, July, 1889) reports three cases of post-partum shock in young healthy women of nervous temperament, in two of whom chloroform was given and the low forceps operation was made; in each the placenta was expressed by Credé's method, and during this pro-

cedure shock so severe as to be most alarming occurred. This endured about three hours; the patients recovered with most active stimulation.

Compression of the ovaries against the uterus in expressing the placenta by Credé's method is thought to have caused this shock: to avoid it, the patient lying on her back, the hand should be passed into the brim of the pelvis obliquely, the ulnar side being pressed deeply down toward the left sacro-iliac synchondrosis, while the thumb should be behind the right ilio-pectineal eminence, the fundus resting in the palm. With the patient on her left side, the hand naturally grasps the uterus obliquely and the danger is less.

Auto-infection in Puerperal Cases.

At the last meeting of the German Society for Gynecology, Kaltenbach (*Münchener med. Wochenschrift*, No. 25, 1889) expressed his belief that while in the great majority of cases infection comes from without, yet the innocuous bacteria found in the vagina may invade the uterus and become pathogenic, especially if the tissues be mechanically injured or destroyed during labor, and absorption of the products of retrograde metamorphosis follows. The attempt to sterilize the genital tract is unnecessary and meddlesome, but a vaginal douche of bichloride of mercury, 1 to 3000, had done him good service, and is used to advantage in protracted cases. The necessity for intra-uterine douches becomes very infrequent when prophylactic douches are given.

Fehling considered many cases of fever in puerperal patients, examples of the absorption fever common in surgical patients, in whom absorption of disintegrating albuminoids, with or without germs, was not rare. In the presence of an abundance of such matter, harmless germs often become virulent. He lays most stress on disinfecting the external parts; the vagina is irrigated only when foul lochia are present. Should the placenta or chorion be retained, interference is demanded. In all labors care is taken that the membranes do not rupture too soon; that perineal tears are avoided by episiotomy; and that the forceps is used before the tissues have been injured by pressure.

Puerperal Eclampsia at Term and at Six Months.

At a recent meeting of the Boston Obstetrical Society (*Boston Medical and Surgical Journal*, August 15, 1889) Broderick reported a case of eclampsia at term, treated successfully by morphia, chloral, hot-air baths, ether by inhalation, and manual dilatation and version; the fœtus perished. Post-partum hemorrhage was controlled by ergot, uterine massage, and ether hypodermatically.

Collins reported the case of a primipara pregnant six months, in whom uræmic eclampsia was treated by manual dilatation and craniotomy; post-partum convulsions continued, and were treated by pilocarpine, digitalis and brandy, and anæsthesia; hot-air baths were employed early in the case. Death occurred, with high temperature.

In discussion, two hours was thought the average time needed for manual dilatation of the cervix. Continuous anæsthesia with ether was advised; in prophylaxis catharsis and chloride of iron.

[These cases illustrate the clinical distinction recently made by Meyer and others between the nephritis not uncommonly occurring just before labor, the "kidney of pregnancy" of the Germans, in which a favorable prognosis is justified, and chronic interstitial nephritis beginning after the fourth month and commonly resulting in persistent, incurable nephritis in the mother if she survives pregnancy, and, in a large number of cases, in intra-uterine fœtal death from placental infarction.—ED.]

THE RELATION OF BACTERIA TO PUERPERAL ECLAMPSIA.

HOLMES (*Amer. Journ. of Obstet.*, August, 1889) considers bacteria, and ptomaines produced by them, the most frequent causes of nephritis and eclampsia in pregnancy. Bacteria may enter the body at the intestinal tract, circulate in the blood, cause capillary thrombosis in the kidneys, with nephritis, by the irritation of the ptomaines which they secrete. The urine from kidneys so affected is toxic, while normal urine is not.

CHLORAL BY STOMACH-TUBE IN ECLAMPSIA.

BLANC (*Arch. de Tocologie*, No. 7, 1889) reports four cases of eclampsia successfully treated by chloral, administered by a stomach-tube. The patients were comatose and deglutition was impossible; the rectum rejected fluids. Care should be taken that the solution be not too concentrated, to avoid vomiting; 1 : 30 or 40 of water is best. From 45 to 60 grains of chloral should be given at a dose; in twelve hours 2½ drachms of chloral may be given, and the amount may be pushed to 4½ drachms in twenty-four hours.

THE PROGNOSIS AND TREATMENT OF CONGENITAL UMBILICAL HERNIA.

LINDFORS (*Centralblatt für Gynäkologie*, No. 28, 1889) has collected 13 cases of congenital umbilical hernia, 10 of which were treated by laparotomy, freshening the edges of the hernial opening, and suture under antiseptic precautions. The remaining 3 were treated expectantly. The treatment by surgical procedure is the only one offering any chance of cure; of the 10 cases so treated, 7 made good recoveries, 3 died; 2 of these cases were operated upon under most unfavorable circumstances. Of the 3 cases treated expectantly, 2 died. Operative treatment may be instituted as early as the second day of life, with success.

A CONTRIBUTION TO THE STUDY OF THE FŒTAL KIDNEY.

NAGEL (*Archiv für Gynäkologie*, Band XXXV. Heft 1) concludes from the anatomical study of the fœtal kidney that it becomes capable of secretion as early as the second month of pregnancy, when it gradually usurps the function of the Wolffian bodies. The fœtal urine is voided into the amniotic liquid early in pregnancy, before the sphincter of the bladder is formed; after the third and fourth month the fœtal bladder retains urine, voiding it at intervals into the amniotic fluid.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,

OF NEW YORK.

Tuberculosis of the Genitals.

Werth's paper on this subject, read at the recent meeting of the German Gynecological Society (*Centralblatt für Gynäkologie*, July 20, 1889), considers only those cases in which surgical treatment is indicated—that is, those in which the tubes are affected. Two forms of tuberculous disease of the tubes should be distinguished, an acute and a chronic; in the former both the muscular and serous coats undergo cheesy degeneration, numerous bacilli being found in the interior of the tube, while in the latter the tubal wall undergoes hypertrophy and cell-infiltration, while its contents contain only a few bacilli. The increase in size of the tube, which may be considerable, is due to the collection of pus in its interior, as well as to the hypertrophy of the wall.

With regard to the treatment of this condition the writer does not agree with Hegar, who advises extirpation of the tuberculous tubes even when the peritoneum is affected; under these circumstances he simply evacuates the contents of the tube, which does not refill. In the discussion following the reading of the paper Elischer agreed with the reader that it was inadvisable to extirpate the tubes in cases of general tuberculosis. Hegar explained that he had been misunderstood as to two points. The reader had quoted him incorrectly as having stated that a tuberculous tube was thickened at its uterine end more frequently than was the case in any other form of salpingitis. He would, of course, not remove the tubes in cases of general tuberculosis, though he would not hesitate to do so when the disease was limited and the tubes were evidently the original foci; if the latter contained pus he would certainly remove them.

The Diagnosis of Incipient Cancer of the Uterus.

Flaischlen (*Deutsche med. Wochenschrift*, June 20, 1889) criticises severely a paper on this subject by Landau, in which the latter agrees with Spiegelberg's opinion, that "while in a clinical sense we may speak of beginning carcinoma (where the disease has not yet progressed far), microscopically we do not as yet recognize incipient cancer."

In opposition to this view stand the valuable observations of Ruge and Veit, supported as they are by numerous cases in which the development of malignant disease of the portio vaginalis was revealed by the microscopical examination of excised bits of the suspected tissue, long before palpation and inspection furnished evidence of the true condition. Landau admits that he, as well as other surgeons, knows of cases of removal of the uterus for beginning epithelioma of the cervix in which the condition was found to be simple erosion, and of other cases in which adenoma, or intra-uterine polypus was mistaken for corporeal epithelioma. His method of procedure in the case of

suspicious growths is not consistent with the opinion before expressed, the writer thinks, since he at once proceeds to excise the erosion.

[We do not see why Landau's paper should be dismissed by the writer as if it hardly deserved recognition, since the former's opinion with regard to the difficulty of making a positive diagnosis of commencing epithelioma is held by many competent observers. His practice of promptly excising a suspicious erosion we regard as eminently proper, as we have expressed in a recent paper on this same subject.—ED.]

EXTIRPATION OF THE UTERUS AND RESECTION OF THE VAGINA FOR PROLAPSUS.

ASCH (*Archiv. für Gyn.*, Bd. XXXV. Heft 2) recommends this radical operation for the cure of prolapsus, especially in the case of working women who desire permanent relief from the condition. Referring to the unsatisfactory results of plastic operations, he quotes the statistics of the Breslau clinic, which show that in only fifty-nine per cent. of the successful ones was the result permanent; other observers had reported but little better success. A patient cannot be called cured who is obliged to wear a pessary, or to have a subsequent operation. Alexander's operation and ventro-fixation are open to the same objection as plastic operations on the vagina and perineum—the liability to recurrence of the displacement from relaxation of the tissues.

In view of the comparative safety of vaginal hysterectomy and the permanence of the cure, this method of curing obstinate prolapse deserves careful consideration. The operation was first performed for this purpose by Gebhardt half a century ago, since which time the uterus has been extirpated seventeen times for complete procidentia (eight times at the Breslau clinic), excluding cases in which the displacement was complicated with cancer. The cases suitable for the radical operation are those of long standing in which the vagina has become so thickened that primary union cannot be expected in colporrhaphy, and those in which the uterus prolapses as soon as it is replaced and no pessary is retained. The patient being a working woman is unable to rest in bed or to have systematic massage with the view of reducing the size of the organ, or she may have had a recurrence after previous successful operations; she should have reached the menopause.

The steps of the operation are as follows: The patient being in the lithotomy position, a rubber cord is first placed about the mass which is to be removed, in order to control the hemorrhage. The cervix is then grasped with a volsella and drawn forcibly upward. Two incisions are made in the posterior vaginal wall at the junction of its upper and middle thirds, and are continued downward until they meet at an acute angle in the median line; Douglas's pouch is opened, and the peritoneum is united to the edge of the vaginal wound. A sponge having been introduced to prevent prolapse of the intestines, the uterus is retroverted and the broad ligaments are exposed and ligated in sections, the appendages being removed if possible. The uterus may easily be separated from the bladder by working from above (from the peritoneal side), the former organ being drawn upward to facilitate this. A triangular portion of the anterior vaginal wall is resected as before. If the bladder is adherent, the dissection may be carried freely into the tissue of the cervix, which is not possible in cases of cancer. Finally, the peritoneum is

sutured to the edge of the anterior vaginal wall, after replacing the bladder, and the stumps of the broad ligaments are united to the lateral edges of the vaginal wound. The opening into the peritoneal cavity is contracted by uniting the vaginal wound laterally.

No raw surface is left, except at the base of the bladder, which is within the peritoneal cavity, while the remains of the vagina are inverted and drawn upward by the traction of the stumps of the broad ligaments and the peritoneum; the latter force is an important one, since it counteracts the tendency to a recurrence of the prolapse.

The opening into the peritoneal cavity is plugged with a cone-shaped tampon of iodoform gauze; the after-treatment does not differ from that ordinarily adopted.

The Subsequent Results of Total Extirpation of the Uterus.

Münchmeyer reported at the third German Gynecological Congress the results of vaginal extirpation of the uterus as performed at the Dresden clinic between 1883 and 1889. The mortality in 160 operations was 5.4 per cent. In 80 cases the uterus was removed on account of cancer; only 4 patients succumbed to the operation, while 14 had since died, 10 from a recurrence of the disease; 62 patients were still living, of whom only 3 had undoubted recurrence. These favorable statistics showed that the operation should be undertaken early. In the discussion which followed Freund and Hegar reported cases in which no recurrence had occurred ten years after the operation.

Ventro-fixation of the Uterus.

Küstner (*Centralblatt für Gynäkologie*, August 10, 1889) makes a further contribution to the literature of this subject. He recommends this operation for the cure of adhesion of the retroflexed uterus only after Schultze's method of replacing the organ has been tried unsuccessfully. In order to prevent the reformation of adhesions he separates them with the Paquelin cautery, whereby the danger of hemorrhage is also lessened. He believes that after the uterus has been attached to the abdominal wall the patient is just as likely to abort if she becomes pregnant as she was when the organ was retroflexed and adherent, hence the operation is not advisable during the age of childbearing.

In the discussion which followed, Frommel took the ground that ventro-fixation merely substituted one pathological condition for another. He preferred to shorten and suture the utero-sacral ligaments to the posterior wall of the pelvis. The operation was facilitated by elevating the patient's hips as much as possible.

Sänger reported twelve cases of ventro-fixation, in five of which the adnexa were not removed. In one of the latter pregnancy subsequently occurred, and had progressed to the sixth month at the time of speaking; during the early weeks the patient complained of pains, as if from the stretching of adhesions. In no instance was there a recurrence of the displacement.

Veit did not believe that ventro-fixation was ever necessary after removal of the tubes and ovaries, since the retroflexion then gave rise to but few symptoms.

Perineorrhaphy by the Flap Operation.

Sänger read at the meeting of the German Gynecological Congress (*Centralblatt für Gynäkologie*, July 27, 1889) a paper on this subject, in which he stated that he had operated seventy-one times by the flap method, in ten cases for complete laceration of the perineum; in every instance the wound healed perfectly. Aside from the rapidity of the operation, the parts are restored by it to their original anatomical condition without the necessity of excising any cicatricial tissue. In a few cases it may be necessary to perform posterior colporrhaphy. The perineal body can be made as broad as is desired by extending the lateral incisions upward on the labia. The author is opposed to the use of the continuous catgut suture, and has also abandoned silkworm-gut for silver wire, which gives the most perfect union. He is not yet sure that this method of perineorrhaphy is preferable to that of Freund, Emmet, and Simon and Hegar in cases of prolapsus without laceration of the perineum, although his own results have been entirely satisfactory.

Salpingostomy.

Under this term Skutsch (*Centralblatt für Gynäkologie*, August 10, 1889) describes a palliative operation for the cure of pyo- and hydro-salpinx, which consists in opening the abdomen, freeing the dilated tube, and after making an explorative puncture with a hypodermatic needle, opening the distal end of the tube and evacuating its contents. If the latter is of a serous character the patency of the tube is assured by excising a portion of its wall and uniting the tubal mucous membrane to the peritoneum by fine silk sutures, after which the tube is returned to the cavity. The writer admits that this would be a hazardous procedure in cases of pyo-salpinx, but suggests that the distal end of the tube might be secured in the abdominal wound, so that the pus might escape externally, and that the adherent tube might be detached and restored to the cavity by a subsequent operation after the catarrh had been cured. The question might be raised whether the end of the tube, after it had been rendered patent, could not be *sutured to the ovary* (!).

[It must strike the reader that this is carrying conservative surgery rather too far.—Ed.]

Corrigendum.

In Dr. Foote's paper on Germicides in our last issue, on page 245, both in the Table and on the last line of the page, *for* "thymol, 1 to 240" *read* "thymol, 1 to 2400."

Note to Contributors.—All communications intended for insertion in the Original Department of this Journal are only received with the distinct understanding that they are contributed *exclusively* to this Journal for publication. Gentlemen favoring us with their communications are considered to be bound in honor to a strict observance of this understanding.

Liberal compensation is made for articles used. Extra copies, in pamphlet form, if desired, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

All communications should be addressed to the Editor,
No. 226 South Twenty-first Street, Philadelphia, U. S. A.

CONTENTS.

ORIGINAL COMMUNICATIONS.

PAGE

How far may a Cow be Tuberculous before her Milk becomes Dangerous as an Article of Food? By HAROLD C. ERNST, A.M., M.D. 439

The Treatment of Phthisis Pulmonalis with Small Doses of Mercury Bichloride Combined with Potassium Iodide. By JOHN R. HALL, M.D. 451

Imperforate Ileum. By J. BLAND SUTTON, F.R.C.S. 457

Local Treatment of Diphtheria. By J. C. MULHALL, M.D. 462

Hysterical Anæsthesia, with a Study of the Fields of Vision. By JOHN K. MITCHELL, M.D., and G. E. DE SCHWEINITZ, M.D. 466

The Use of Oxygen in the Treatment of Leukæmia and Grave Anæmias. By J. M. DA COSTA, M.D., LL.D., and E. P. HERSHEY, M.D. 482

Some Manifestations of Lithæmia in the Upper Air-passages. By F. WHITEHILL HINKEL, A.M., M.D. 491

REVIEWS.

A Treatise on Surgery—its Principles and Practice. By T. Holmes, M.A. Cantab. . 495

The Mechanism of the Circulation of the Blood through Organically Diseased Hearts. By Herbert Davies, M.D., F.R.C.P. 496

On Cancer of the Uterus; being the Harveian Lectures for 1886. By John Williams, M.D., F.R.C.P. 498

On Electrolytic Operations in the Upper Air-passages. By Dr. R. Kafemann. . 499

The Treatment of Epilepsy. By William Alexander, M.D., F.R.C.S. 500

Lessons in Operative Gynecology. By Vulliet and Luteaud 502

The Causation of Disease. An Exposition of the Ultimate Factors which Induce it. By Harry Campbell, M.D., B.S. (Lond.) 502

Studies in Clinical Medicine A Record of Some of the More Interesting Cases observed and of Some of the Remarks made at the Author's Out-patient Clinic in the Edinburgh Royal Infirmary. By Byrom Bramwell, M.D., F.R.C.P. Ed, F.R.S.E. 503

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

PAGE

Comparative Value of Antipyrin, Antifebrin, and Phenacetin as Antipyretics 505

Dangers of Antithermic and Analgesic Anilides 506

Intra-venous Injections of Salt Solution 508

Hydroxylamine 509

Chloramide 510

Sugar as a Diuretic 510

Ergot in Childbed 511

For Migraine 511

For Toothache 511

MEDICINE.

Some Remarks on Typhoid Fever; with an Analysis of 129 Cases . 512

Naphthalin and Typhoid Fever. . 513

Equino-telluric Origin of Tetanus . 514

Antifebrin in Epilepsy . . . 515

A Case of Tumor of the Cauda Equina, illustrating Certain Points in Spinal Localization 515

Origin of the Vesicular Respiratory Murmur 517

Two Cases of Aneurism of the Arch of the Aorta 518

A New Method for Estimation of Albumin in the Urine . . . 519

Safranine—A New Reagent for Sugar. 520

The Detection of Gonococci . . 520

SURGERY.

	PAGE
Transfusion	521
The Treatment of Surgical Shock	523
The Surgical Aspect of Tuberculosis	524
Syphilis in Old Age	526
Lumbar Hernia	526
Ether Irrigations in Strangulated Hernia	527
The Extirpation of Varices of the Lower Extremity	527
The Surgery of the Spine	528
Oblique Osteotomy for Anterior Curvature of the Tibia	529
The Effect of the Entrance of Air into the Circulation	530

OPHTHALMOLOGY.

Ophthalmia Photo-electrica	531
Corneal Astigmatism after Cataract Extraction	532
A New Treatment for Panophthalmitis	533
A Case of Permanent Conjugate Deviation of the Eyes and Head, the Result of a Lesion Limited to the Sixth Nucleus; with Remarks on Associated Lateral Movements of the Eyeballs, and Rotation of the Head and Neck	534

OTOLOGY.

New Antiseptic Artificial Tympanic Membrane	535
Otology during the Past Year (1888)	535
The Tampon as a Dressing in Suppurative Diseases of the Middle Ear	536
The Etiology and Treatment of Chronic Suppurative Catarrh of the Ear	536

OBSTETRICS.

The Use and Abuse of Antiseptic Injections in Obstetrical Practice	538
Obstinate Vomiting of Pregnancy	538
The Posture and Bearing of the Pregnant Woman	538
The Treatment of Placenta Prævia	539
Studies of the Kyphotic Pelvis	539
An Obliquely Contracted Pelvis following Scleroderma	539
The Technique of Embryotomy	539
Five Cases of Extra-uterine Pregnancy	540
A Case of Rupture of the Uterus and a Case of Cæsarean Section	540
The Causes and Treatment of Rupture of the Uterus	541
The Causes and Treatment of Post-partum Hemorrhage	541
The Treatment of Post-partum Hemorrhage	542
The Treatment of Uterine Colic by Antipyrin	542
Idiocy following the Use of the Forceps	542
Obstetric Practice in the Maternity of Lariboisière	542
The Morbidity and Mortality in Parturition	542
The Treatment of Ophthalmia Neonatorum by Naphthol	543
Encephalocele and Ectopion Cordis caused by Amniotic Adhesion	543

GYNECOLOGY.

Adhesion of the Omentum to the Symphysis Pubis as an Indication for Laparotomy	543
The Intra-peritoneal Injection of Salt Solution in Severe Hemorrhage	544
The Surgical Treatment of Tuberculosis of the Peritoneum	545
Intermittent Hydronephrosis	545
Manual Emptying of the Bladder	546
Amyloid Degeneration of an Intra-uterine Polypus	546
The Manner in which Müller's Ducts open into the Sinus Urogenitalis	546
Cystic Myomata of the Uterus	547
Atrophy of the Uterus and Ovaries	547
Slight Cystic Degeneration of the Ovary	548
The Internal Crossing of the Ovum	548